

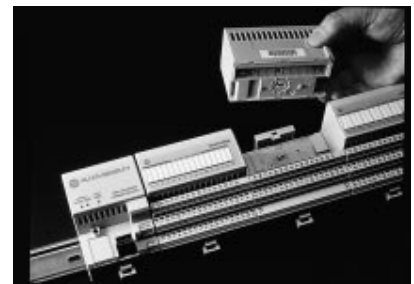
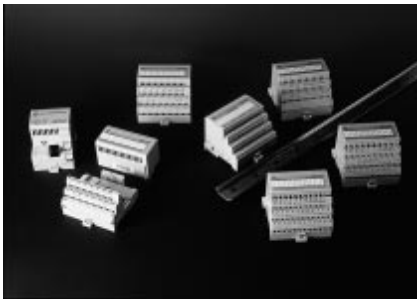


Allen-Bradley

Technical Data

FLEX I/O and FLEX Integra

1794 Series and 1793 Series



Flexible, Inexpensive, and Compact

FLEX I/O™ and FLEX Integra™ are flexible, low-cost, modular I/O systems for distributed applications that offer all the functions of larger, rack-based I/O without the space requirements. With FLEX I/O and FLEX Integra, you can independently select the I/O to meet your application needs.

Additional Savings for Larger Systems

FLEX I/O and FLEX Integra require only one adapter to communicate with up to eight I/O modules. When you need more I/O or use a combination of different I/O modules, you can meet system requirements without buying additional power supplies.

Compatibility Now and In the Future

With the proper adapter, your FLEX I/O and/or FLEX Integra system can communicate over the Remote I/O network, DeviceNet™ network, and ControlNet™ network. You can add components as your system requirements change.

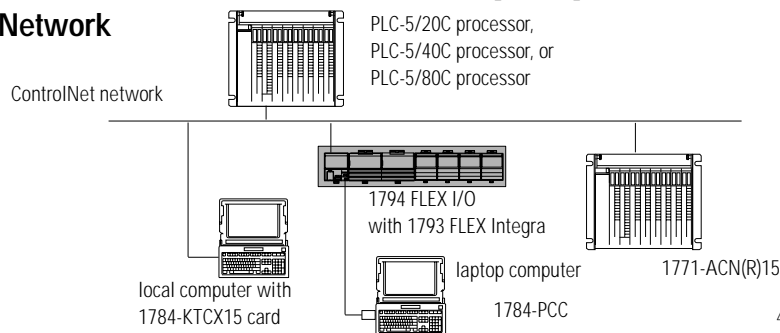
Low Installation, Wiring, and Maintenance Costs

FLEX I/O consists of a terminal strip with an I/O interface. Use the terminal strip on the terminal base to wire your field devices directly. Differing from FLEX I/O, FLEX Integra integrates the terminal strip and I/O modules into one compact unit. Wiring directly saves you:

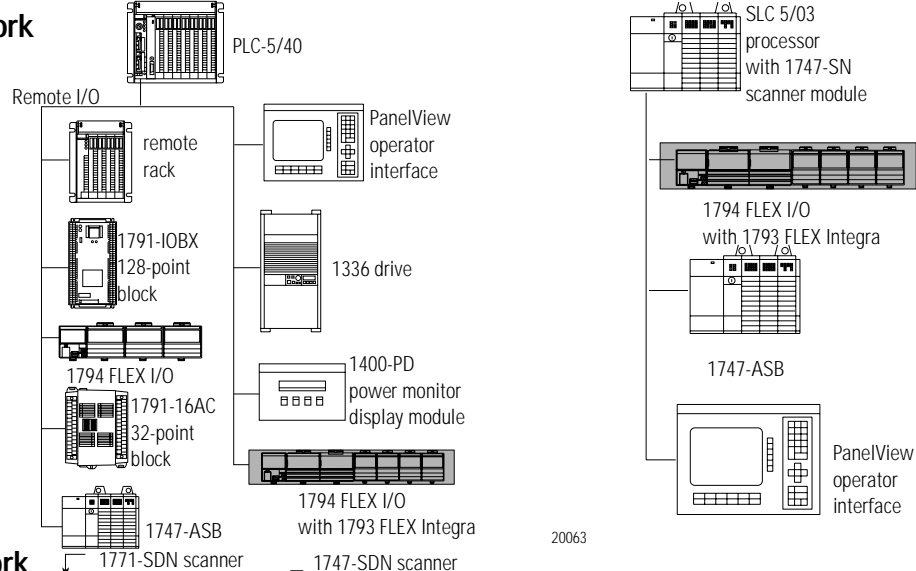
- installation and testing time
- additional wiring and external terminal blocks
- control marshalling panel space

FLEX I/O and FLEX Integra provide additional savings if system problems develop. Combining your field-wiring terminations and the I/O interface into the same location saves you time and money by making your system easier to maintain and troubleshoot. Additionally, the full-featured FLEX I/O system allows you to remove and insert modules under backplane power without disrupting your system.

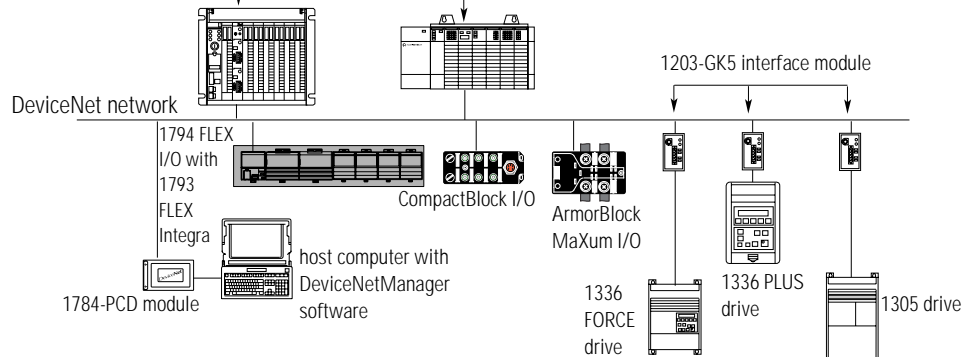
ControlNet Network



Remote I/O Network



DeviceNet Network

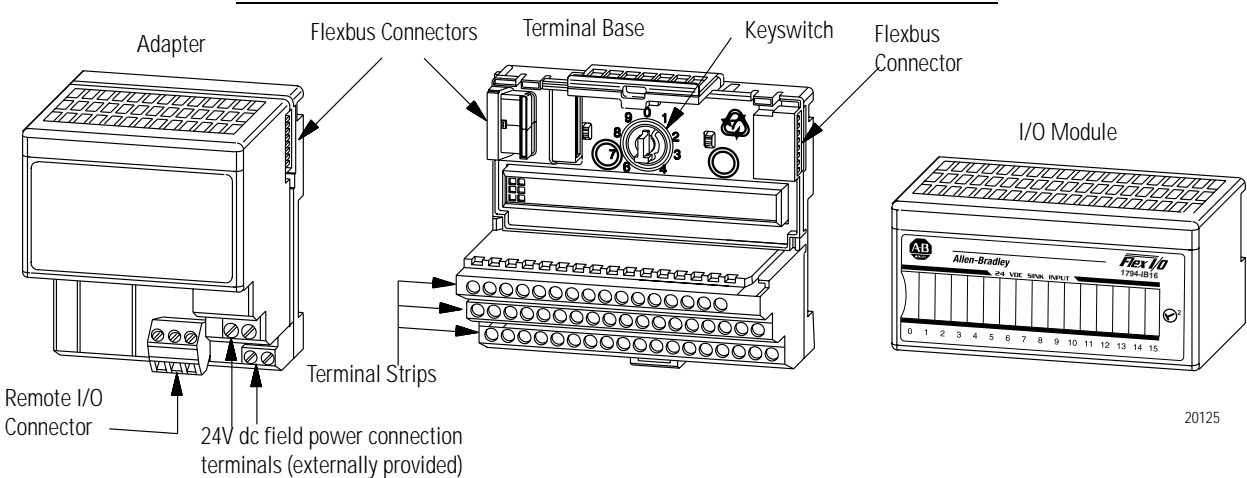


For information on	See page
1794 FLEX I/O	3
1793 FLEX Integra	4

About the FLEX I/O System

FLEX I/O consists of three space-saving components:

- adapters
- terminal base units
- I/O modules



20125

Use the adapter to power the internal logic for as many as eight I/O modules and transfer the I/O data back to a PLC™ processor or a SLC™ processor via one of several available networks.

Two separate connection terminals for field power let you daisy-chain power connections to adjacent terminal bases.

Insert the terminal base into your system using the positive-locking flexbus connectors.

Use a three-wire terminal base to wire directly to a two- or three-wire device.

Terminate most of your wiring on the terminal base with almost no need for terminal blocks.

Use the terminals to daisy-chain power connections to adjacent terminal bases, or connect individual power supplies to each base to isolate modules.

Adjust the keyswitch to prevent incorrect module insertion into a preconfigured terminal base.

Exchange terminal bases without moving other bases in your system.

Plug the I/O module into the terminal base. Use the module to connect to the I/O bus and field devices.

Remove and insert a module without disturbing the field wiring, other I/O modules, or system power.

ATTENTION



Remove field-side power before removing or inserting an I/O module. Modules are designed so you can remove and insert them under backplane power. When you remove or insert a module while field-side power is applied, you may cause an electrical arc. An electrical arc can cause personal injury or property damage because it may:

- send an erroneous signal to your system’s field devices causing unintended machine motion
- cause an explosion in a hazardous environment

Repeated electrical arcing causes excessive wear to the contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

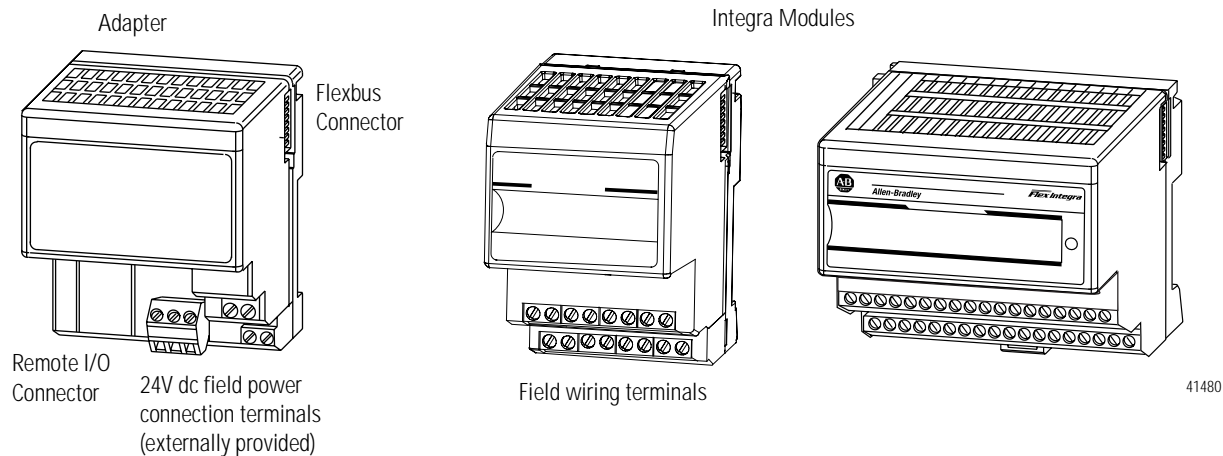
About the FLEX Integra System

FLEX Integra I/O consists of a range of digital and analog modules, all capable of use with 1794 FLEX I/O adapters and other FLEX I/O modules. Each module is available with either screw-cage or spring-clamp wire terminations.

TIP



FLEX Integra modules were designed to fit to the right of your FLEX I/O modules. Be sure to place your FLEX Integra modules to the right of your FLEX I/O modules when designing your system.



Use the adapter to power the internal logic for as many as eight I/O modules and transfer the I/O data back to a PLC™ processor or a SLC™ processor via one of several available networks.

Two separate connection terminals for field power let you daisy-chain power connections to adjacent FLEX I/O terminal bases.

Insert the module into your system using the positive-locking flexbus connectors.

Terminate all of your wiring on the module with no need for terminal blocks.

Use the terminals to daisy-chain power connections to adjacent FLEX I/O terminal bases, or connect individual power supplies to each base to isolate modules.

ATTENTION



Do not remove an Integra module under power. Removing the module under power will break the electrical backplane (flexbus) connections. This can cause personal injury or property damage by:

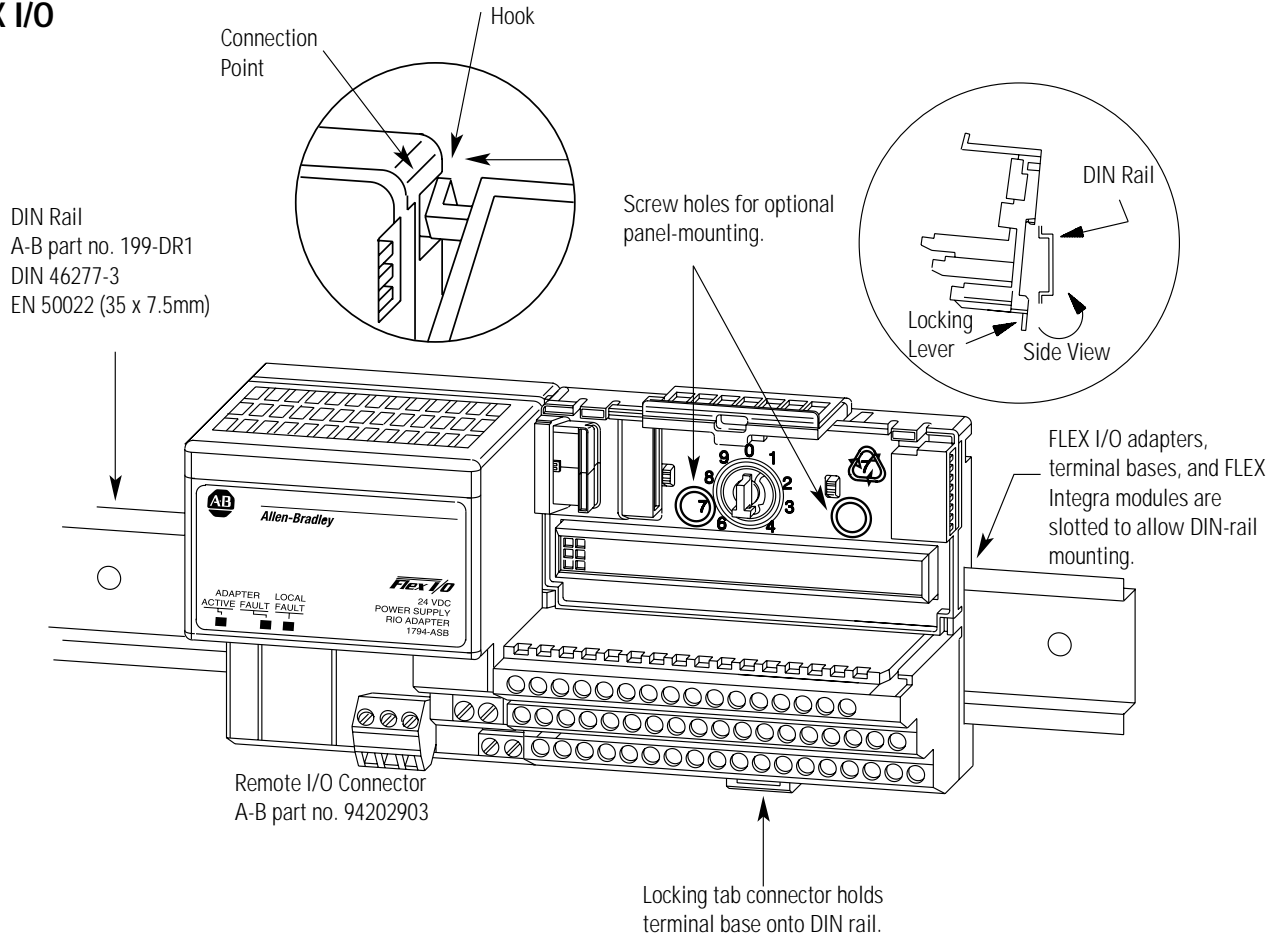
- sending an erroneous signal to your system's field devices causing unintended machine motion
- causing an explosion in a hazardous environment
- breaking communications beyond this module

Mount and Remove Your System Easily

You can horizontally or vertically mount the FLEX I/O system and FLEX Integra modules on a standard 35mm DIN rail. The adapter and FLEX I/O terminal base easily snap on the DIN rail by hand. Use a flat-blade screwdriver to remove components from the DIN rail.

Screw holes allow you to horizontally or vertically panel-mount your FLEX I/O system in an enclosure. To panel-mount your FLEX I/O system, use the optional mounting kit (1794-NM1). An example of a DIN-rail mounted system is shown below.

FLEX I/O



20127

When you use FLEX I/O modules in a high-vibration installation, and particularly when mounting the modules vertically, we recommend using DIN-rail locks (Allen-Bradley part no. 1492-EA35).

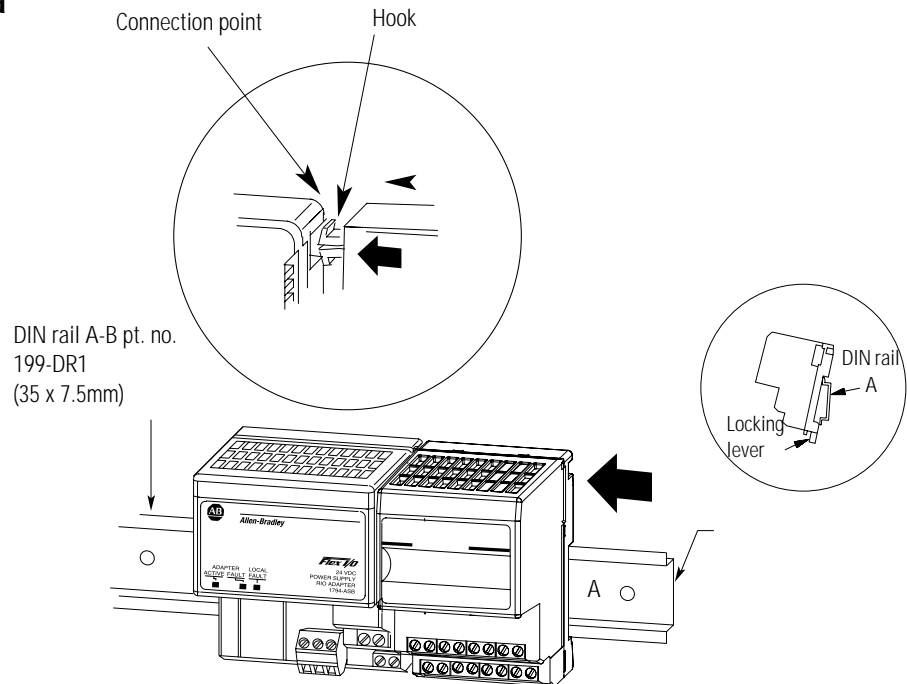
ATTENTION



The hook (on the terminal base) and adjacent connection point (on the adapter) keep the terminal bases tight together (see exploded view above). These components are capable of maintaining a reliable connection in case of shock and/or vibration. Refer to the environmental conditions information in each module's specifications.

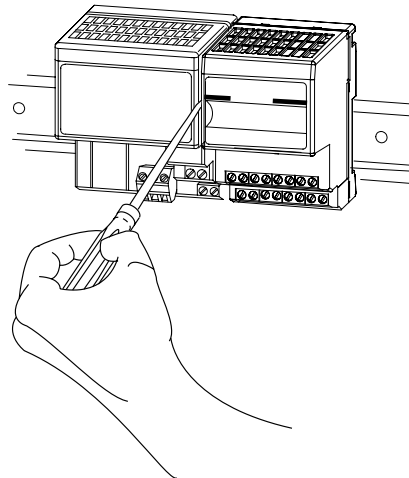
FLEX Integra modules mount on the DIN rail. After the module locks into place, firmly push the Integra module into the adjacent module to complete the backplane connection. When removing an Integra module, insert a flat-bladed screwdriver between the modules, and twist 1/4 turn. Then release the locking lever and remove the module.

FLEX Integra



41479

To remove:



41373

ATTENTION



The hook (on the terminal base) and adjacent connection point (on the adapter) keep the terminal bases tight together (see exploded view above). These components are capable of maintaining a reliable connection in case of shock and/or vibration. Refer to the environmental conditions information in each module's specifications.

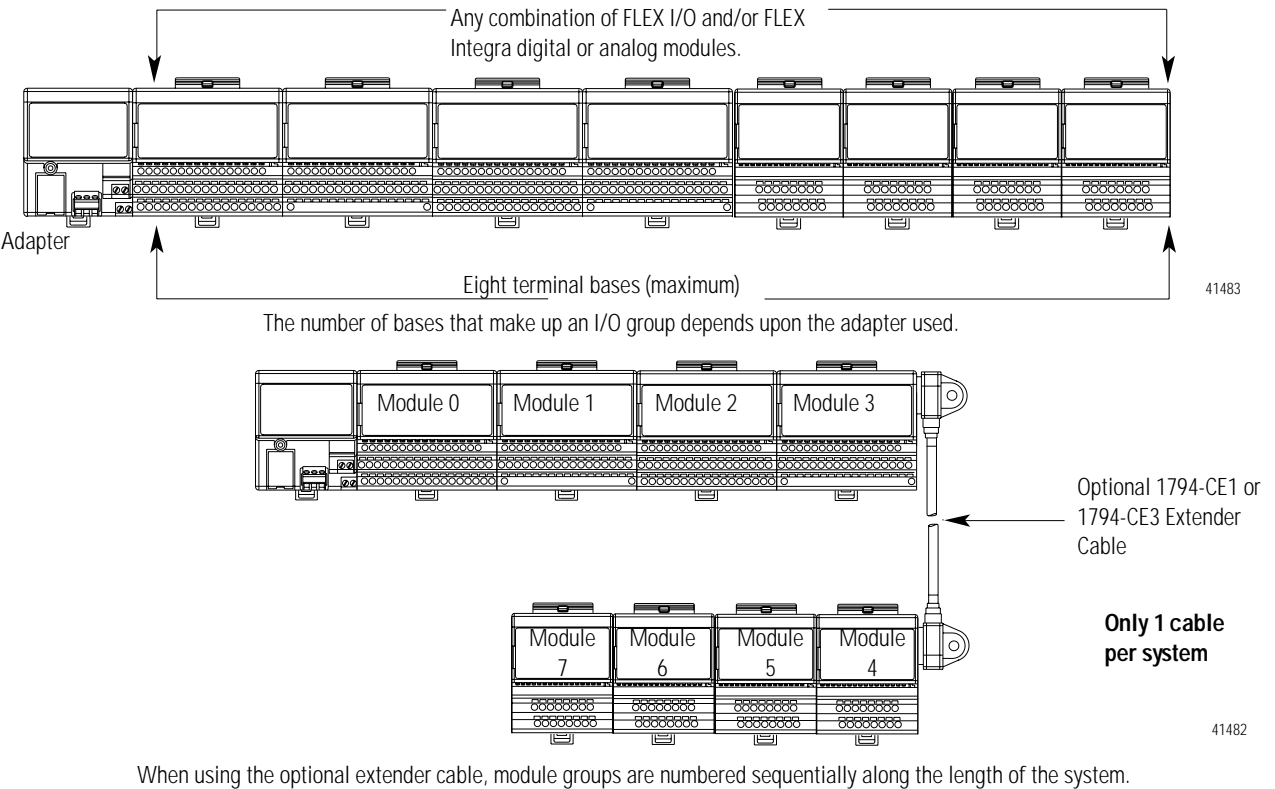
Design Your Configuration

You can use as many as eight FLEX I/O and/or FLEX Integra modules per adapter. This flexibility allows a wide range of digital and analog I/O points per adapter. Mix and match digital and analog I/O to meet your application needs.

You can use FLEX Integra modules with FLEX I/O modules.

TIP

Place Integra modules to the right of your FLEX I/O modules when designing your system.



When using the optional extender cable, module groups are numbered sequentially along the length of the system.

What this Product Data Contains

Use the following tables to find information in this technical data.

For Information On	See Page
Terminal Base Compatibility Cross-Reference Chart	17
Choosing the Correct Counter Module for Your Application	134
Related Publications	152
Mounting Dimensions and Spacing Requirements	154
Support, Training, and Repair Services	155

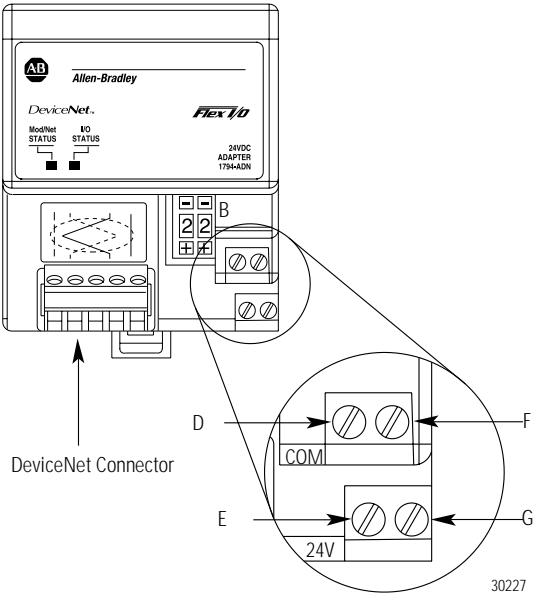
For Information On	Catalog Number	Description	See Page
Adapters	1794-ADN	24V dc DeviceNet Adapter	11
	1794-ACN15	24V dc ControlNet Adapter	12
	1794-ACNR15	24V dc ControlNet Redundant Media Adapter	13
	1794-ASB2/B & /C	24V dc Remote I/O Adapter (to 2 modules)	14
	1794-ASB/C& /D	24V dc Remote I/O Adapter (to 8 modules)	15
Terminal Base Units	1794-TB2	2-Wire Screw Clamp Terminal Base Unit	19
	1794-TB3	3-Wire Screw Clamp Terminal Base Unit	20
	1794-TB3S	3-Wire Spring Clamp Terminal Base Unit	21
	1794-TB3T	Temperature Terminal Base Unit	22
	1794-TB3TS	Spring Clamp Temperature Terminal Base Unit	24
	1794-TB3G	Screw Clamp Grounded Terminal Base Unit	24
	1794-TB3GS	Spring Clamp Grounded Terminal Base Unit	25
	1794-TBN	Terminal Base Unit (NEMA-Style Screws)	26
	1794-TBNF	Fused Terminal Base Unit (NEMA-Style Screws)	27
	1203-FB1	SCANport™ Terminal Base Unit	29
1794 AC 120V ac Modules	1794-IA8	120V ac 8 Input Module	32
	1794-IA8I	120V ac 8 Isolated Input Module	34
	1794-IA16	120V ac 16 Input Module	36
	1794-OA8	120V ac 8 Output Module	38
	1794-OA8I	120V ac 8 Isolated Output Module	40
	1794-OA16	120V ac 16 Output Module	42
220V ac Modules	1794-IM8	220V ac 8 Input Module	44
	1794-OM8	220V ac 8 Output Module	46
1793 DC 24V dc Modules	1793-IB4, -IB4S	24V dc 4 Sink Input Module	51
	1793-IB16, -IB16S	16 Sink Input Module	53
	1793-IV16, IV16S	16 Source Input Module	55
	1793-OB4P, -OB4PS	24V dc 4 Source Output (Protected) Module	57
	1793-OB16, -OB16S	16 Source Output Module	59
	1793-OV16P, -OV16PS	16 Protected Sink Output Module	61
	1793-IB2XOB2P, -IB2XOB2PS	24V dc 2 Input/2 Protected Output Combo Module	63
1794 DC 24V dc Modules	1794-IB8	24V dc 8 Sink Input Module	65
	1794-IB16	24V dc 16 Sink Input Module	67
	1794-IV16	24V dc 16 Source Input Module	69
	1794-OB8	24V dc 8 Source Output Module	71
	1794-OB16	24V dc 16 Source Output Module	73
	1794-OB16P	24V dc 16 Source Output (Protected) Module	75

	For Information On	Catalog Number	Description	See Page
1794 DC		1794-OV16	24V dc 16 Sink Output Module	77
		1794-OV16P	24V dc 16 Sink Output (Protected) Module	79
		1794-OB8EP	24V dc Electronically Fused 8 Output Module	81
		1794-IB10XOB6	24V dc 10 Input/6 2A Output Combo Module	83
1793 Analog	48V dc Modules	1794-IC16	48V dc 16 Sink Input Module	86
		1794-OC16	48V dc 16 Source Output Module	88
	24V dc Modules	1793-IE4, -IE4S	24V dc 4 Input Analog Module	91
		1793-OE2, -OE2S	24V dc 2 Output Analog Module	93
1794 Analog	24V dc Modules	1793-IE2XOE1, -IE2XOE1S	24V dc 2 Input/1 Output Analog Combo Module	95
		1794-IE8/B	24V dc Selectable Analog 8 Input Module	98
		1794-OE4/B	24V dc Selectable Analog 4 Output Module	100
		1794-IE4XOE2/B	24V dc 4 Input/2 Output Analog Combo Module	103
Isolated Analog	24V dc Source Modules	1794-IF4I	24V dc Source Isolated Analog 4 Input Module	108
		1794-OF4I	24V dc Source Isolated Analog 4 Output Module	111
		1794-IF2XOF2I	24V dc 2 Input/2 Output Isolated Analog Combo Module	114
1793 Relay	Relay Module	1793-OW4, -OW4S	4 Relay Sink/Source Output Module	118
1794 Relay	Relay Module	1794-OW8	8 Relay Sink/Source Output Module	120
Specialty	RTD Input Module	1794-IR8	24V dc RTD Input Module	123
	Thermocouple/RTD Input Module	1794-IRT8	24V dc Thermocouple/RTD Module	126
	Thermocouple/mV Input Module	1794-IT8	24V dc Thermocouple/mV Module	129
Counters	SCANport Module	1203-FM1	24V dc SCANport Module	132
	Frequency Input Module	1794-IJ2	24V dc 2 Input Frequency Module	135
	Very High Speed Counter Module	1794-VHSC	24V dc 2 Channels Very High Speed Counter Module (Used with 1794-ACN15 or ACNR15 only)	139
	2-Channel Pulse Counter Input Module	1794-ID2	24V dc 2 Input Pulse Counter Module	142
Power Supply	4-Channel Pulse Counter Input Module	1794-IP4	12/24V dc 4 Input Pulse Counter Module	145
	Power Supply	1794-PS13	Power Supply Module	148
Accessories	Accessories	1794-CE1	Extender Cable, 0.3m (1ft)	150
		1794-CE3	Extender Cable, 0.9m (3ft)	150
		1794-NM1	Mounting Kit	150
		1794-CJC2	Cold Junction Compensator Kit	150
		1794-LBL	Label Kit	151
			RSWire Software	151
			ABECAD Software	151

Use the following table to determine which adapter will meet your application needs.

Adapter	Purpose	See Page
<i>1794-ADN</i>	Connects up to 8 I/O modules to the DeviceNet network	11
<i>1794-ACN15</i>	Connects the FLEX I/O system to the ControlNet network	12
<i>1794-ACNR15</i>	Connects the FLEX I/O system to the ControlNet network with optional redundant media capability	13
<i>1794-ASB2/B & /C</i>	Connects the FLEX I/O system (up to 2 modules) to the Remote I/O network	14
<i>1794-ASB/C & /D</i>	Connects the FLEX I/O system (up to 8 modules) to the Remote I/O network	15

Wiring



Connect	To
BLK Wire	-V
BLU Wire	CAN ¹ Low
Bare Wire	Drain
WHT Wire	CAN High
RED Wire	+V

1 CAN = Controller Area Network

ATTENTION

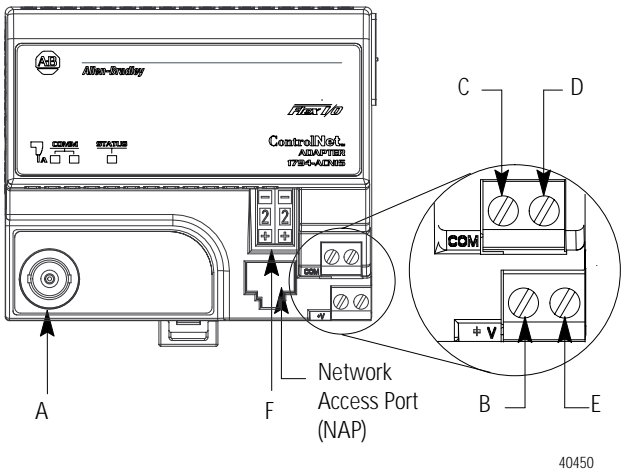
When connecting wiring, torque terminal screws **D**, **E**, **F**, and **G** to 7-9 inch-pounds.

- NOTE:**The wiring label on the front of the module shows the cable colors.
1. Connect the DeviceNet cable to the removable connector.
 2. Insert connector into mating connector on DeviceNet adapter module.
 3. Connect +24V dc input to the left side of the lower connector, terminal **E**.
 4. Connect 24V common to the left side of the upper connector, terminal **D**.
 5. Connections **G** and **F** are used to pass 24V dc power and common to the next module in the series (if required).
 6. Set the network address using the 2-position thumbwheel switch **B**. Valid settings range from 00 to 63. Press either the + or - buttons to change the number.

Specifications - 1794-ADN	
I/O Capacity	8 modules
Connector Screw Torque	7-9 inch-pounds
Power Supply	Note: In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	125k bit/s 250k bit/s 500k bit/s
Indicators	Mod/Net status - red/grn I/O status - red/grn
Flexbus Output Current	640mA maximum @ 5V dc
Isolation Voltage	500V ac for 1s between user power and flexbus
Power Consumption	400mA maximum from external 24V supply
Power Dissipation	7.6W maximum @ 19.2V dc
Thermal Dissipation	26 BTU/hr @ 19.2V dc
DeviceNet Power Requirements	24V dc (±4%) @ 90mA maximum
DeviceNet Cable	Allen-Bradley part no. 1485C-P1-Cxxx. Refer to publication DN-2.5 for more information.
General Specifications	
Dimensions HxWxD	87mm x 68mm x 69mm (3.4in x 2.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock/Operating	30g peak acceleration, 11(±1)ms pulse width
Non-operating	50g peak acceleration, 11(±1)ms pulse width
Vibration	Tested 5g @ 10-500Hz per IEC 68-2-6
Power Conductors	
Type	Copper (stranded or solid)
Wire Size	12 gauge (4mm ²) stranded maximum
Category	3/64 (1.2mm) inch insulation max. 2 ¹
Publications	
Installation Instructions	1794-5.14
User Manual	1794-6.5.5
Agency Certification	<div><div></div><div>Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Groups IIC certified</div><div></div></div>

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Wiring







ATTENTION

When connecting wiring, torque terminal screws B, C, D, and E to 7-9 inch-pounds.

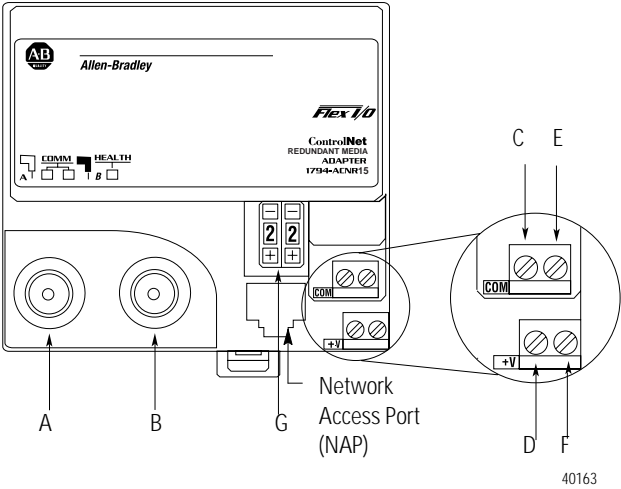


1. Connect the ControlNet network cable to connector, terminal **A**.
2. Connect +24V dc input to the left side of the lower connector, terminal **B**.
3. Connect 24V common to the left side of the upper connector, terminal **C**.
4. Connections **D** and **E** are used to pass 24V dc power (E) and 24V common (D) to the next module in the series (if required).
5. Set the network address using the 2-position thumbwheel switch **F**. Valid settings range from 01 to 99. Press either the + or - buttons to change the number.

Specifications - 1794-ACN15	
I/O Capacity	8 modules
Connector Screw Torque	7-9 inch-pounds
Power Supply	Note: In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	5M bit/s
Supports Redundant ControlNet Cabling	No
Indicators	Comm A - red/grn I/O Status - red/grn
Programming Ports	1 RJ-45 Network Access Port (NAP) for use with ControlNet programming cable (e.g. 1786-CP cable)
Flexbus Output Current	640mA maximum @ 5V dc
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	400mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 19.2V dc
Thermal Dissipation	15.7 BTU/hr @ 19.2V dc
General Specifications	
Dimensions HxWxD	87mm x 94mm x 69mm (3.4in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
ControlNet Cable	Belden RG-6/U Quad Shield
Power Conductors	
Type	Copper (stranded or solid)
Wire Size	12 gauge (4mm ²) stranded maximum
Category	3/64 (1.2mm) inch insulation max. 2 ¹
Publication	
Installation Instructions	1794-5.47
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified  

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Wiring



ATTENTION

When connecting wiring, torque terminal screws C, D, E, and F to 7-9 inch-pounds.

1.

Connect the ControlNet network cable to connector **A**.
2.

Connect the redundant ControlNet network cable to connector **B**.
- When using the 1794-ACNR15 as a single channel, use channel A.
3.

Connect +24V dc input to the left side of the lower connector, terminal **D**.
4.

Connect 24V common to the left side of the upper connector, terminal **C**.
5.

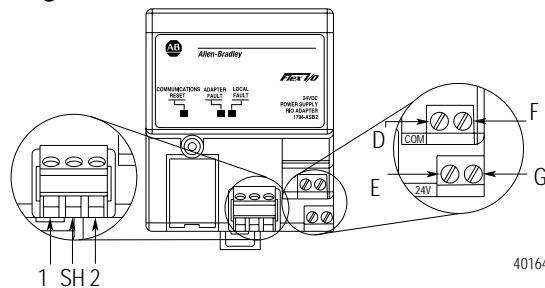
Connections **E** and **F** are used to pass 24V dc power (F) and 24V common (E) to the next module in the series (if required).
6.

Set the network address using the 2-position thumbwheel switch **G**. Valid setting range from 01 to 99. Press either the + or - buttons to change the number.

Specifications - 1794-ACNR15	
I/O Capacity	8 modules
Connector Screw Torque	7-9 inch-pounds
Power Supply	Note: In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	5M bit/s
Supports Redundant ControlNet Cabling	Yes
Indicators	Comm A - red/grn (channel A) Comm B - red/grn (channel B) I/O status - red/grn
Programming Ports	1 RJ-45 Network Access Port (NAP) for use with ControlNet programming cable (e.g. 1786-CP cable)
Flexbus Output Current	640mA maximum @ 5V dc
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	400mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 19.2V dc
Thermal Dissipation	15.7 BTU/hr @ 19.2V dc
General Specifications	
Dimensions HxWxD	87mm x 94mm x 69mm (3.4in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
ControlNet Cable	Belden RG-6/U Quad Shield
Power Conductors	
Type	Copper (stranded or solid)
Wire Size	12 gauge (4mm ²) stranded maximum 3/64 (1.2mm) inch insulation max.
Category	2 ¹
Publication	
Installation Instructions	1794-5.48
Agency Certification	<div><div></div><div></div><div>Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified</div><div></div></div> <div></div>

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Wiring



The series C adapter can communicate with FLEX Integra analog modules.

ATTENTION

When connecting wiring, torque terminal screws D, E, F, and G to 7-9 inch-pounds.



1. Connect the remote I/O cable to the removable remote I/O connector.
2. Connect +24V dc input to the left side of the lower connector, terminal **E**.
3. Connect 24V common to the left side of the upper connector, terminal **D**.
4. Connections **G** and **F** are used to pass 24V dc power (G) and 24V common (F) to the next module in the series (if required).
5. Make wiring connections as described in the installation instructions included with the module that mounts on your terminal base unit.

This adapter module is shipped configured for standard addressing mode. In standard addressing mode, this module can be used as a replacement for 1794-ASB2/A 2-slot Remote I/O adapters.

The 1794-ASB2/ adapter module can interface a maximum of 2 I/O modules. This adapter can be used in the mode that requires a unique location address for each I/O module and can also be used in a mode that allows duplicate addressing of I/O modules.

Duplicate addressing of I/O modules allows the maximum amount of I/O in a system for a given amount of I/O image area. An input module can have the same location address as an output module because they complement each other. The input module uses only the input image area corresponding to the address. The output module uses only the output image area corresponding to the address.

Description of Modes

Addressing Type	Module Placement Rules	Legal Module Placements
Standard	<ul style="list-style-type: none"> 2 terminal bases per adapter Each terminal base represents 1 I/O group 	<ul style="list-style-type: none"> Any module in any slot
Compact 16-point addressing	<ul style="list-style-type: none"> 2 terminal bases per adapter Each module represents 1/2 of an I/O group 2 modules represent 1 I/O group 	<ul style="list-style-type: none"> A 16-point input module and a 16-point output module in an I/O group
Compact 8-point addressing digital modules	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Not applicable

Description of Modes (continued)

Compact 8-point addressing analog modules	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Not applicable
Complementary 16-point addressing	<ul style="list-style-type: none"> 2 terminal bases per adapter 2 modules, 1 in primary, and 1 in complement represent 1 I/O group 	<ul style="list-style-type: none"> Any module in any I/O position of the primary chassis, input modules complemented by output modules, analog modules complemented by analog modules or empty base
Complementary 8-point addressing	<ul style="list-style-type: none"> 2 terminal bases per adapter 4 modules, 2 in the primary and 2 in the complement, represents 1 I/O group 	<ul style="list-style-type: none"> 2 inputs in a group complemented by 2 outputs 2 outputs in a group complemented by 2 inputs 2 block transfer modules complemented by 2 empty slots 1 block transfer module and 1 input in a group complemented by 1 empty slot and 1 output module

Specifications - 1794-ASB2/B & /C

The 1794-ASB2/B & /C adapter cannot be used with PLC-2 processors.

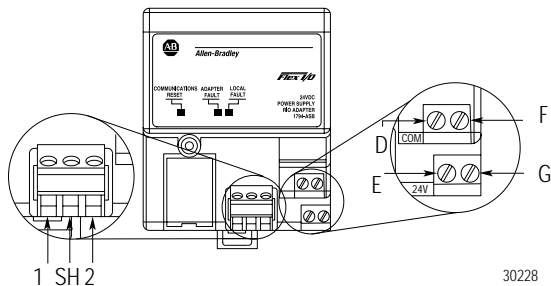
I/O Capacity	2 modules
Power Supply	Note: In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	57.6, 115.2, 230.4k bit/s
Indicators	Adapter active - green Adapter fault - red, Local fault - red
Flexbus Output Current	640mA maximum
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	450mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	15.7 BTU/hr @ 31.2V dc

General Specifications

Dimensions HxWxD	87mm x 68mm x 69mm (3.4in x 2.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Remote I/O Cable	Belden 9463 or equivalent as specified in A-B Approved Vendor List, publication ICCG-2.2 A-B pin connector part no. 942029-03
Power Conductors	
Wire Size	12 gauge (4mm ²) stranded maximum 3/64 (1.2mm) inch insulation max.
Category	2 ¹
Publication	
Installation Instructions	1794-5.46
User Manual	1794-6.5.9
Agency Certification	Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Wiring



The series D adapter can communicate with FLEX Integra analog modules.

ATTENTION

When connecting wiring, torque terminal screws D, E, F, and G to 7-9 inch-pounds.






1. Connect the remote I/O cable to the removable remote I/O connector.
2. Connect +24V dc input to the left side of the lower connector, terminal **E**.
3. Connect 24V common to the left side of the upper connector, terminal **D**.
4. Connections **G** and **F** are used to pass 24V dc power (G) and 24V common (F) to the next module in the series (if required).
5. Make wiring connections as described in the installation instructions included with the module that mounts on your terminal base unit.

The 1794-ASB adapter module can interface a maximum of 8 I/O modules. This adapter can be used in the mode that requires a unique location address for each I/O module and can also be used in a mode that allows duplicate addressing of I/O modules.

Duplicate addressing of I/O modules allows the maximum amount of I/O in a system for a given amount of I/O image area. An input module can have the same location address as an output module because they complement each other. The input module uses only the input image area corresponding to the address. The output module uses only the output image area corresponding to the address.

Description of Modes		
Addressing Type	Module Placement Rules	Legal Module Placements
Standard	<ul style="list-style-type: none">8 terminal bases per adapterEach terminal base represents 1 I/O group	<ul style="list-style-type: none">Any module in any slot
Compact 16-point addressing	<ul style="list-style-type: none">8 terminal bases per adapterEach module represents 1/2 of an I/O group2 modules represent 1 I/O group8 modules = 1/2 I/O rack	<ul style="list-style-type: none">A 16-point input module and a 16-point output module in an I/O group
Compact 8-point addressing digital modules	<ul style="list-style-type: none">8 terminal bases per adapterEach module represents 1/4 of an I/O group4 modules represent 1 I/O group	<ul style="list-style-type: none">Two 8-point input modules and two 8-point output modules in an I/O groupModule type must alternate within an I/O group: input, output, etc.

Description of Modes (continued)		
Compact 8-point addressing analog modules	<ul style="list-style-type: none">8 terminal bases per adapterEach module and adjacent empty base represents 1/2 of an I/O group	<ul style="list-style-type: none">Two block transfer modules and their adjacent empty base = 1 I/O group - An empty slot must accompany each block transfer module in 8-point compact addressing
Complementary 16-point addressing	<ul style="list-style-type: none">8 terminal bases per adapter2 modules, 1 in primary, and 1 in complement represent 1 I/O group	<ul style="list-style-type: none">Any module in any I/O position of the primary chassis, input modules complemented by output modules, analog modules complemented by analog modules or empty base
Complementary 8-point addressing	<ul style="list-style-type: none">8 terminal bases per adapter4 modules, 2 in the primary and 2 in the complement, represents 1 I/O group	<ul style="list-style-type: none">2 inputs in a group complemented by 2 outputs2 outputs in a group complemented by 2 inputs2 block transfer modules complemented by 2 empty slots1 block transfer module and 1 input in a group complemented by 1 empty slot and 1 output module

















































Specifications - 1794-ASB/C & /D	
The 1794-ASB/C & /D adapter cannot be used with PLC-2 processors.	
I/O Capacity	8 modules
Power Supply	Note: In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	57.6, 115.2, 230.4k bit/s
Indicators	Adapter active - green Adapter fault - red, Local fault - red
Flexbus Output Current	640mA maximum
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	450mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	15.7 BTU/hr @ 31.2V dc
General Specifications	
Dimensions HxWxD	87mm x 68mm x 69mm (3.4in x 2.7in x 2.7in)
Environmental Conditions	Operational Temperature: 0 to 55°C (32 to 131°F) Storage Temperature: -40 to 85°C (-40 to 185°F) Relative Humidity: 5 to 95% noncondensing Shock: 30g peak acceleration, 11(±1)ms pulse width Operating: 50g peak acceleration, 11(±1)ms pulse width Non-operating: Tested 5g @ 10-500Hz per IEC 68-2-6
Remote I/O Cable	Belden 9463 or equivalent as specified in A-B Approved Vendor List, publication ICCG-2.2 A-B pin connector part no. 942029-03
Power Conductors	Wire Size: 12 gauge (4mm ²) stranded maximum 3/64 (1.2mm) inch insulation max. Category: 2 ¹
Publication	Installation Instructions: 1794-5.46 User Manual: 1794-6.5.9
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified  Class I Zone 2 Group IIC certified












































































¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Use the following table to determine which FLEX I/O terminal base unit will meet your application needs.

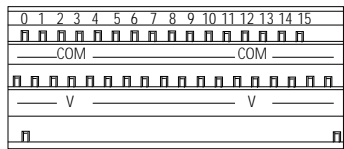
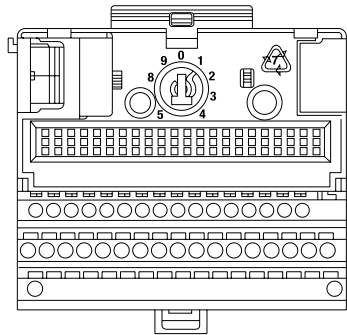
Terminal Base	Purpose	See Page
<i>1794-TB2</i>	A generic version of the 1794-TB3 below	19
<i>1794-TB3</i>	Primarily intended for use with input modules when using 3-wire input proximity switches - can also be used with output modules	20
<i>1794-TB3S</i>	A spring clamp version of the cage clamp 1794-TB3 above - provides faster, simpler wire installation	21
<i>1794-TB3T</i>	Required with the 1794-IT8 module (when used in thermocouple mode) - also provides chassis ground connections for the 1794-IR8 and analog modules	22
<i>1794-TB3TS</i>	A spring clamp version of the 1794-TB3T	24
<i>1794-TB3G</i>	A screw clamp terminal base unit with individual grounding used with certain analog modules	24
<i>1794-TB3GS</i>	A spring clamp version of the 1794-TB3G	25
<i>1794-TBN</i>	Provides screw terminals to accept larger gauge wires plus cover for I/O wiring	26
<i>1794-TBNF</i>	Provides 8 5x20mm fuses, screw terminals, plus a cover for I/O wiring - shipped with fuses for the 1794-OA8 module; can be used to fuse the 1794-OM8 and -OW8 modules with a replacement fuse (see the installation instructions)	27
<i>1203-FB1</i>	Required with the 1203-FM1 module	29

The following table illustrates the recommended FLEX I/O terminal base unit(s) for each module. Many terminal base units can be used with most modules, but auxiliary terminal strips may be required.

FLEX I/O Product	Catalog Number	Recommended Base	Compatible Base(s)
AC 120V ac Modules	1794-IA8		  
	1794-IA8I		  
	1794-IA16		  Auxiliary terminal strips are required when using the TBN for the IA16
	1794-OA8		   
	1794-OA8I		   
	1794-OA16		   Auxiliary terminal strips are required when using the TBN for the OA16
220V ac Modules	1794-IM8		None
	1794-OM8		
DC 24V dc Modules	1794-IB8		
	1794-IB16		
	1794-IV16		 
	1794-OB8		 
	1794-OB16		 
	1794-OB16P		 
	1794-OV16		
	1794-OV16P		

FLEX I/O Product		Catalog Number	Recommended Base	Compatible Base(s)		
DC 24V dc Modules		1794-OB8EP				
		1794-IB10XOB6				
48V dc Modules		1794-IC16				
		1794-OC16				
Analog 24V dc Modules		1794-IE8/B				 
		1794-OE4/B				  
		1794-IE4XOE2/B				 
Isolated Analog 24V dc Source Modules		1794-IF4I				  
		1794-OF4I				  
		1794-IF2XOF2I				  
Relay	Relay Module	1794-OW8				 
Specialty	RTD Input Module	1794-IR8				 
	Thermocouple/RTD Input Module	1794-IRT8				
	Thermocouple/mV Input Module	1794-IT8				  You can use a TB2, TB3, or TB3S for mV inputs only.
	SCANport Module	1203-FM1				
Counter	Frequency Input Module	1794-IJ2				
	Very High Speed Counter Module	1794-VHSC			For use with 1794-ACN(R)15 only.	
	2 Channel Pulse Counter Input Module	1794-ID2				 Auxiliary terminal strips are required when using the TBN or TBNF for the ID2
	4 Channel Pulse Counter Input Module	1794-IP4				 Auxiliary terminal strips are required when using the TBN or TBNF for the IP4

1794-TB2



V = 24V dc, 120V ac, or 48V dc
COM = 24V dc common, 120V ac common, or 48V dc common

- A 0-15
- B 16-33
- C 34 & 51

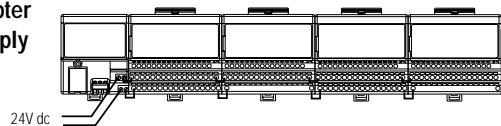
1794-TB2 Terminal Base Unit	
A - 0 through 15	Input/Output
B - 16 through 33	24V dc Common, 120V ac Common, or 48V dc Common
C - 34 and 51	+24V dc Power, 120V ac, or 48V dc

ATTENTION



- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base/adaptor. Failure to lock the hook into the adjacent base/adaptor can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adaptor. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Daisy-chaining Using Adapter Power Supply

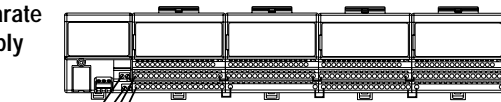


Use this method when wiring all digital modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A

40093

Daisy-chaining with a Separate Power Supply



24V dc
24V dc or
120V ac

Use this method when wiring all ac digital modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A

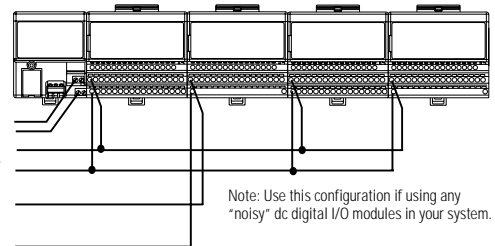
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42149

Individually Powered from Separate Power Supply

24V dc
24V dc,
120V ac, or
48V dc

24V dc or
48V dc



Note: Use this configuration if using any "noisy" dc digital I/O modules in your system.

Thermocouple Module wiring is separate from digital wiring.

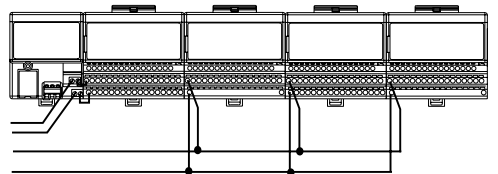
Wiring when total current draw is greater than 10A

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40094

Combination Daisy-chain and Separate Power Supply

24V dc
24V dc



Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.

Total current draw through any base unit must not be greater than 10A




Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40095

Specifications - 1794-TB2

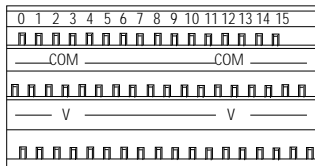
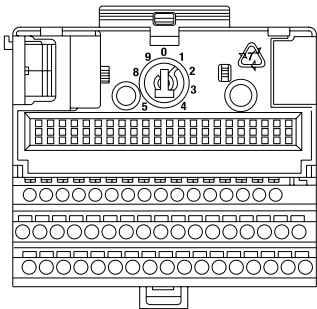
Number of Terminals	1 row of 16 1 row of 18 1 row of 2
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	132V ac maximum
Isolation Voltage	Channel-to-channel isolation determined by inserted module (see publication 1794-5.2)

General Specifications

Dimensions (with module installed in base) HxWxD	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Vibration	50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 22 gauge (0.35mm ²) minimum 3/64 inch (1.2mm) insulation maximum
Category	2 ¹
Publication	1794-5.2
Installation Instructions	
Agency Certification	
  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified	
	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3



V = 24V dc, 120V ac, or 48V dc
COM = 24V dc common, 120V ac common, or 48V dc common
40090

0-15 (A)
16-33 (B)
34-51 (C)

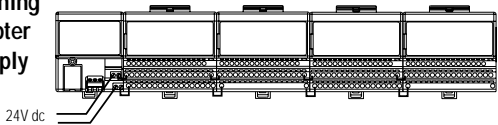
1794-TB3 Terminal Base Unit	
A - 0 through 15	Input/Output
B - 16 through 33	24V dc Common, 120V ac Common, or 48V dc Common
C - 34 through 51	+24V dc Power, 120V ac, or 48V dc

ATTENTION



- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base/adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

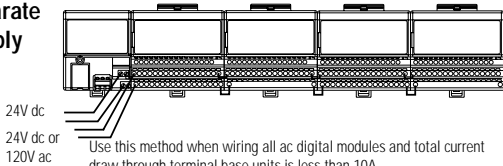
Daisy-chaining Using Adapter Power Supply



Use this method when wiring all digital modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A 40093

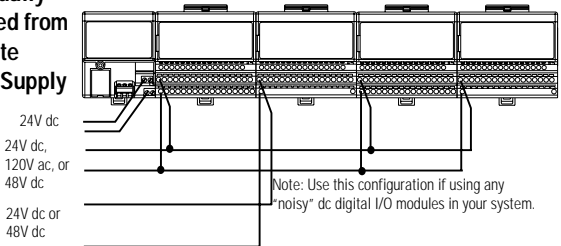
Daisy-chaining with a Separate Power Supply



Wiring when total current draw is less than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42149

Individually Powered from Separate Power Supply



Note: Use this configuration if using any "noisy" dc digital I/O modules in your system.

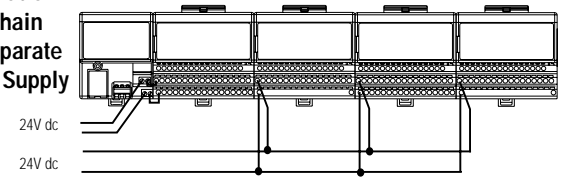
Thermocouple Module wiring is separate from digital wiring.

Wiring when total current draw is greater than 10A

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40094

Combination Daisychain and Separate Power Supply



Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.

Total current draw through any base unit must not be greater than 10A




Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40095

Specifications - 1794-TB3

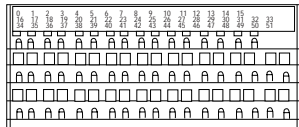
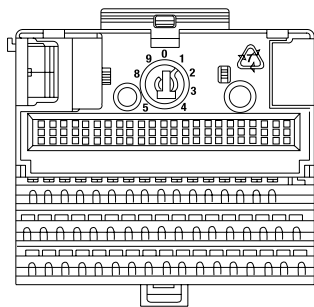
Number of Terminals	1 row of 16 2 rows of 18
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	132V ac maximum
Isolation Voltage	Channel-to-channel isolation determined by inserted module (see publication 1794-5.2)

General Specifications

Dimensions (with module installed in base) HxWxD	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 22 gauge (0.35mm ²) minimum 3/64 inch (1.2mm) insulation maximum
Category	2 ¹
Publication	
Installation Instructions	1794-5.2
Agency Certification	
  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 	

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3S



0-15 **A**
16-33 **B**
34-51 **C**
40091

1794-TB3S Terminal Base Unit

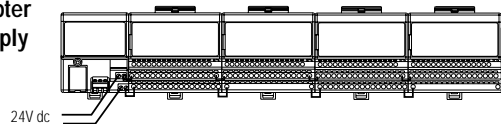
A - 0 through 15	Input/Output
B - 16 through 33	24V dc Common, 120V ac Common, or 48V dc Common
C - 34 through 51	+24V dc Power, 120V ac, or 48V dc

ATTENTION



- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base/adaptor. Failure to lock the hook into the adjacent base/adaptor can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adaptor. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Daisy-chaining Using Adapter Power Supply

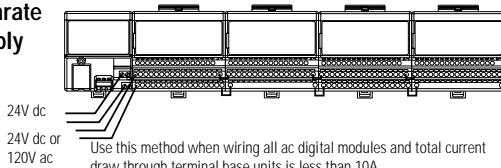


Use this method when wiring all digital modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A

40093

Daisy-chaining with a Separate Power Supply

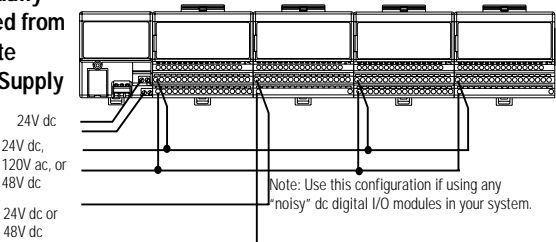


Wiring when total current draw is less than 10A

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42149

Individually Powered from Separate Power Supply



Note: Use this configuration if using any "noisy" dc digital I/O modules in your system.

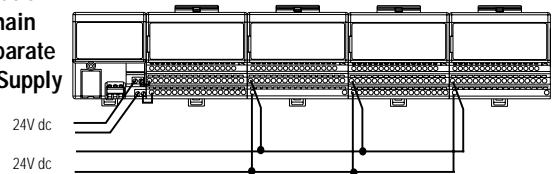
Thermocouple Module wiring is separate from digital wiring.

Wiring when total current draw is greater than 10A

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40094

Combination Daisychain and Separate Power Supply



Note: All modules powered by the same power supply must be analog modules for this configuration.

Total current draw through any base unit must not be greater than 10A

Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.




Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

40095

Specifications - 1794-TB3S

Number of Terminals	1 row of 16 2 rows of 18
Terminal Type	Spring-clamp - To open, insert bladed screwdriver (0.100-0.120in/2.54-3.05mm) and lift up.
Current Capacity	10A maximum
Voltage Rating	132V ac maximum
Isolation Voltage	Channel-to-channel isolation determined by inserted module (see publication 1794-5.2)

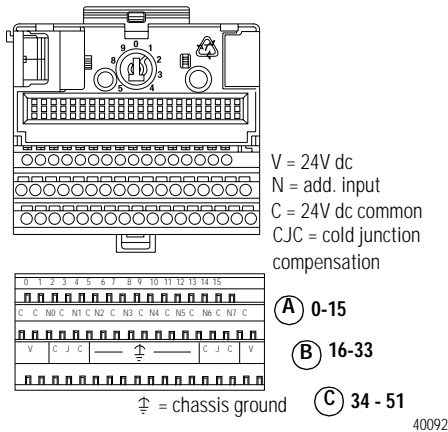
General Specifications

Dimensions (with module installed in base) HxWxD	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum, 22 gauge (0.35mm ²) minimum 3/64 inch (1.2mm) insulation maximum
Category	(Established by inserted module.) ¹
Publication	1794-5.42
Installation Instructions	
Agency Certification	
	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3T

The temperature terminal base has connections for cold junction compensation, and 8 terminals designated for shield termination to chassis ground.



Wiring

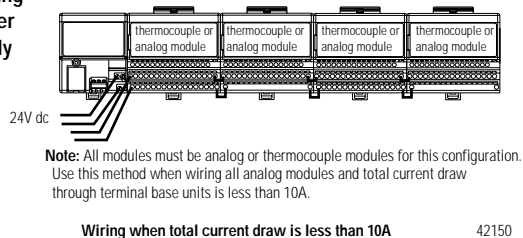
1794-TB3T Terminal Base Unit					
Channel	High Sig (+)	Low Sig (-)	Sig Ret	Reserved	Shld Ret ¹
0	0	1	17(C)	18(N0)	39
1	2	3	19(C)	20(N1)	40
2	4	5	21(C)	22(N2)	41
3	6	7	23(C)	24(N3)	42
4	8	9	25(C)	26(N4)	43
5	10	11	27(C)	28(N5)	44
6	12	13	29(C)	30(N6)	45
7	14	15	31(C)	32(N7)	46
24V dc Common	16, 17, 19, 21, 23, 25, 27, 29, 31, and 33				
+24V dc power	34, 35, 50, and 51				
Terminals 36-38 and 47-49 are used with cold junction compensators only.					
1	Terminals 39-46 are chassis ground.				

ATTENTION

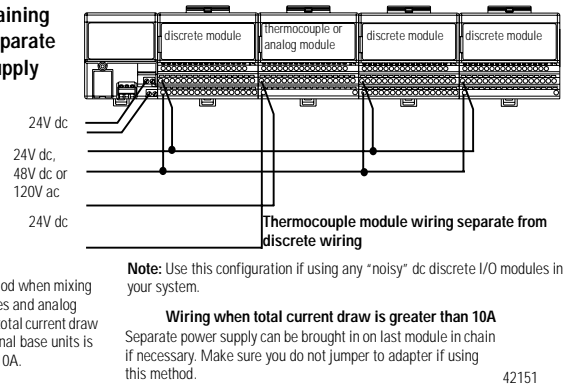


- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Do not daisy chain power or ground from the thermocouple terminal base unit to any ac or dc digital module terminal base unit.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

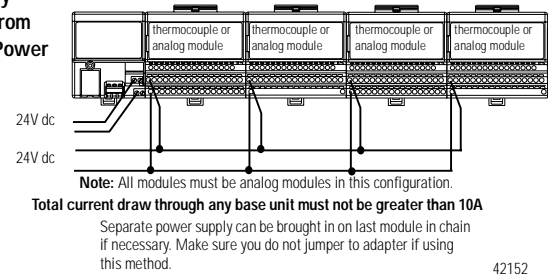
Daisy-chaining Using Adapter Power Supply



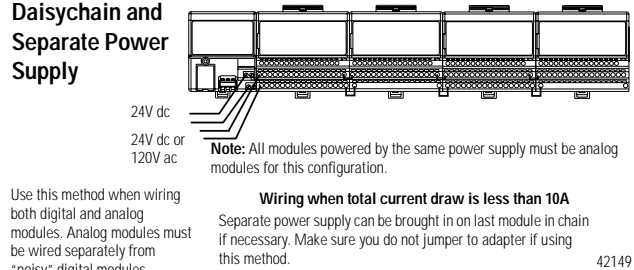
Daisy-chaining with a Separate Power Supply



Individually Powered from Separate Power Supply



Combination Daisychain and Separate Power Supply

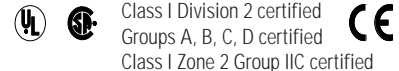


Specifications - 1794-TB3T

Number of Terminals	1 row of 16: 2 rows of 18
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	132V ac maximum
Isolation Voltage	Ch-to-ch isolation determined by inserted mod

General Specifications

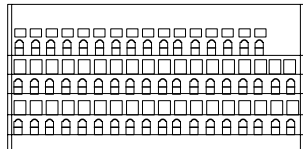
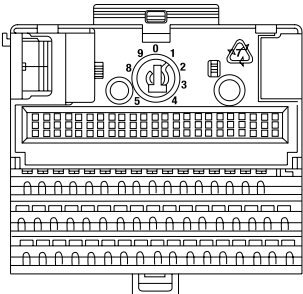
Dimensions (w/mod in base)	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors	Wire Size
	12 gauge (4mm ²) stranded maximum
	22 gauge (0.35mm ²) minimum
	3/64 inch (1.2mm) insulation maximum
	(Established by inserted module.) ¹
Category	
Publication	
Installation Instructions	1794-5.41
Agency Certification	



¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3TS

The temperature terminal base has connections for cold junction compensation, and 8 terminals designated for shield termination to chassis ground.



- A 0-15
- B 16-33
- C 34 - 51 40836

Wiring

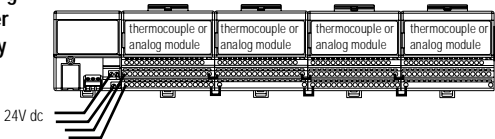
1794-TB3TS Terminal Base Unit					
Channel	High Sig (+)	Low Sig (-)	SigRet	Reserved	Shld Ret ¹
0	0	1	17(C)	18(N0)	39
1	2	3	19(C)	20(N1)	40
2	4	5	21(C)	22(N2)	41
3	6	7	23(C)	24(N3)	42
4	8	9	25(C)	26(N4)	43
5	10	11	27(C)	28(N5)	44
6	12	13	29(C)	30(N6)	45
7	14	15	31(C)	32(N7)	46
24V dc Common 16, 17, 19, 21, 23, 25, 27, 29, 31, and 33					
+24V dc power 34, 35, 50, and 51					
Terminals 36-38 and 47-49 are used with cold junction compensators only.					
1 Terminals 39-46 are chassis ground.					

ATTENTION



- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Do not daisy chain power or ground from the thermocouple terminal base unit to any ac or dc digital module terminal base unit.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

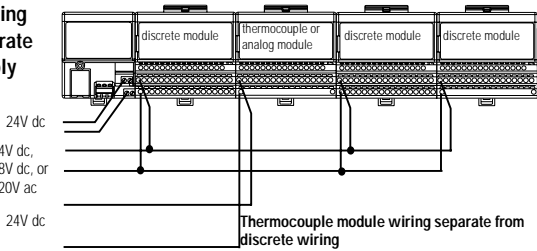
Daisy-chaining Using Adapter Power Supply



Note: All modules must be analog or thermocouple modules for this configuration. Use this method when wiring all analog modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A 42150

Daisy-chaining with a Separate Power Supply



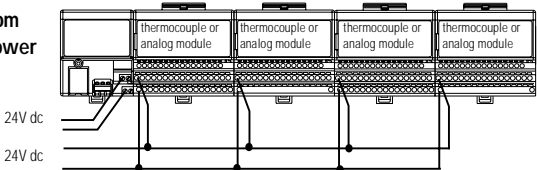
Note: Use this configuration if using any "noisy" dc discrete I/O modules in your system.

Use this method when mixing digital modules and analog modules and total current draw through terminal base units is greater than 10A.

Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42151

Individually Powered from Separate Power Supply

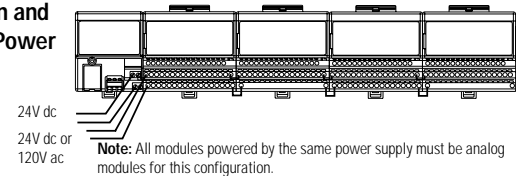


Note: All modules must be analog modules in this configuration.

Total current draw through any base unit must not be greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42152

Combination Daisychain and Separate Power Supply



Note: All modules powered by the same power supply must be analog modules for this configuration.

Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.

Wiring when total current draw is less than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42149

Specifications - 1794-TB3TS

Number of Terminals	1 row of 16; 2 rows of 18
Terminal Type	Spring-clamp - To open, insert bladed screwdriver (0.120-0.125in/2.54-3.05mm) and lift up.
Current Capacity	10A maximum
Voltage Rating	132V ac maximum
Isolation Voltage	Ch-to-ch isolation determined by inserted module

General Specifications

Dimensions (w/mod in base)	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	

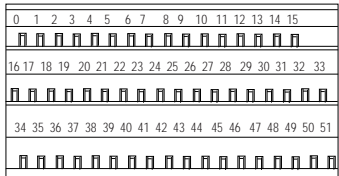
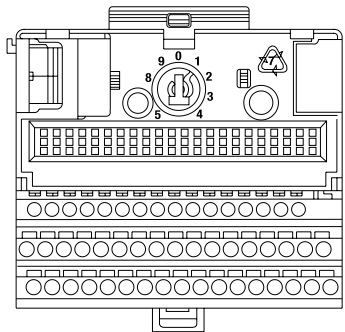
Conductors	Wire Size	12 gauge (4mm ²) stranded maximum, 22 gauge (0.35mm ²) minimum
	Category	3/64 inch (1.2mm) insulation maximum 2 ¹

Publication	Installation Instructions	1794-5.43
-------------	---------------------------	-----------

Agency Certification		UL Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified CE
----------------------	--	---

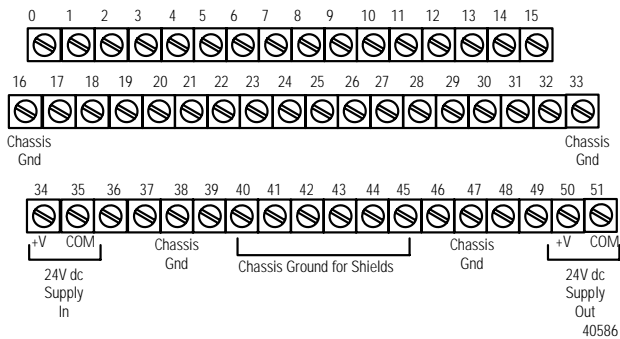
1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3G



41901

Wiring

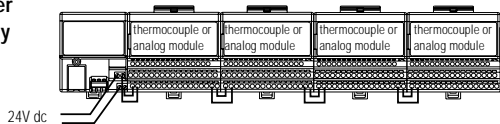


ATTENTION



- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Do not daisy chain power or ground from the thermocouple terminal base unit to any ac or dc digital module terminal base unit.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Daisy-chaining Using Adapter Power Supply

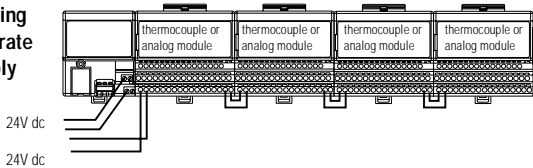


Use this method when wiring all analog modules and total current draw through terminal base units is less than 10A.

Wiring when total current draw is less than 10A

42153

Daisy-chaining with a Separate Power Supply



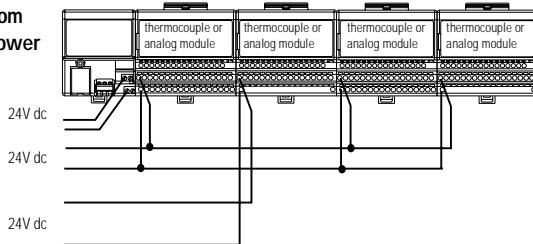
Use this method when wiring thermocouple or analog modules and total current draw through terminal base units is greater than 10A.

Note: All modules powered by the same power supply must be thermocouple or analog modules for this configuration.

Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42154

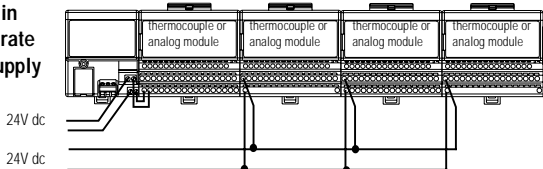
Individually Powered from Separate Power Supply



Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42155

Combination Daisychain and Separate Power Supply



Note: All modules powered by the same power supply must be thermocouple or analog modules for this configuration.

Total current draw through any base unit must not be greater than 10A

Use this method to balance current draw if necessary.




Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42156

Specifications - 1794-TB3G

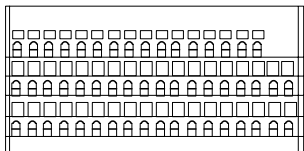
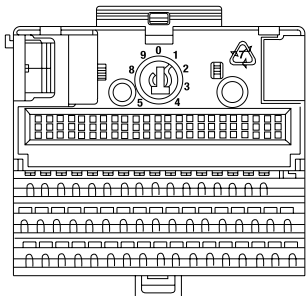
Number of Terminals	1 row of 16; 2 rows of 18
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	31.2V dc maximum
Isolation Voltage	Channel-to-channel isolation determined by inserted module

General Specifications

Dimensions (w/mod in base)	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 22 gauge (0.35mm ²) minimum 3/64 inch (1.2mm) insulation maximum
Category	Category is dependent upon installed module. ¹
Publication Installation Instructions	1794-5.51
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

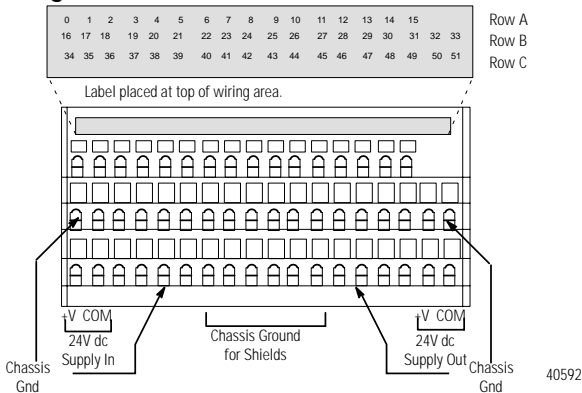
¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

1794-TB3GS



40836

Wiring

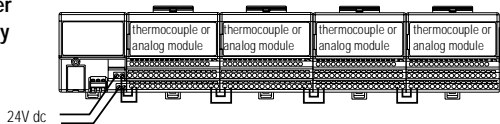


ATTENTION



- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Do not daisy chain power or ground from the thermocouple terminal base unit to any ac or dc digital module terminal base unit.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Daisy-chaining Using Adapter Power Supply



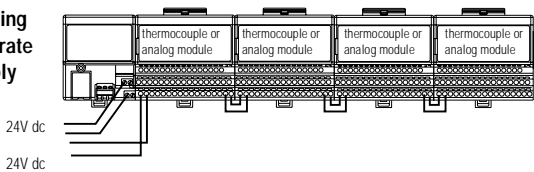
Use this method when wiring all analog modules and total current draw through terminal base units is less than 10A.

Note: All modules must be analog modules for this configuration.

Wiring when total current draw is less than 10A

42153

Daisy-chaining with a Separate Power Supply



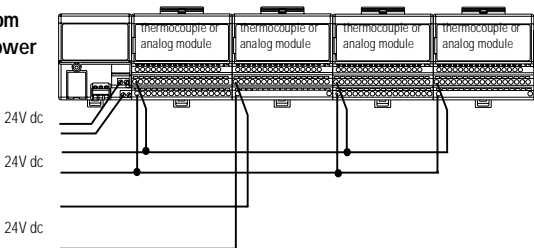
Use this method when wiring all analog modules and total current draw through terminal base units is greater than 10A.

Note: All modules powered by the same power supply must be analog modules for this configuration.

Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42154

Individually Powered from Separate Power Supply

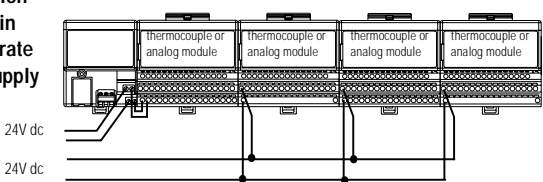


Wiring when total current draw is greater than 10A

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42155

Combination Daisychain and Separate Power Supply



Note: All modules powered by the same power supply must be analog modules for this configuration.

Total current draw through any base unit must not be greater than 10A

Use this method to balance current draw if necessary.

Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42156

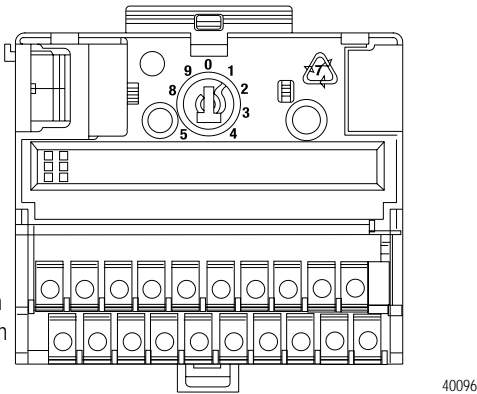
Specifications - 1794-TB3GS

Number of Terminals	1 row of 16; 2 rows of 18
Terminal Type	Spring-clamp - To open, insert bladed screwdriver (0.100-0.120in/2.54-3.05mm) and lift up.
Current Capacity	10A maximum
Voltage Rating	31.2V dc maximum
Isolation Voltage	Ch-to-ch isolation determined by inserted module
General Specifications	
Dimensions (w/module in base)	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Vibration	50g peak acceleration, 11(±1)ms pulse width
Conductors	Wire Size
Wire Size	12 gauge (4mm ²) stranded maximum, 22 gauge (0.35mm ²) minimum
Category	3/64 inch (1.2mm) insulation maximum
Category	Category is dependent upon installed module. ¹
Publication	1794-5.59
Agency Certification	
UL	Class I Division 2 certified
CSA	Groups A, B, C, D certified
CE	Class I Zone 2 Group IIC certified

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

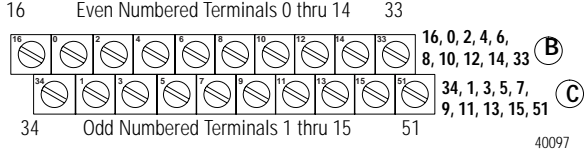
1794-TBN

Shown with
fuse cover in
the "open"
position



Wiring

1794-TBN



ATTENTION






- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Specifications - 1794-TBN

Number of Terminals	2 rows of 10 terminals with cover
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	264V ac maximum
Isolation Voltage	Tested at 2500V dc for 1s between user terminals and logic side circuitry Channel-to-channel isolation determined by inserted module.

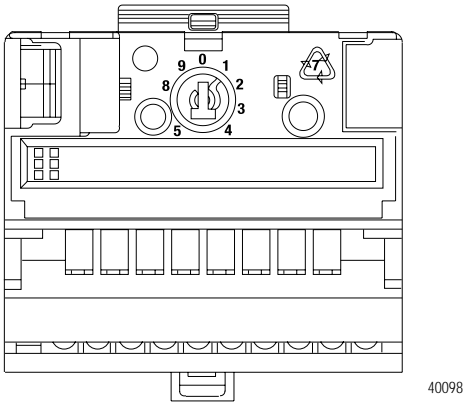
General Specifications

Dimensions (with module installed in base) HxWxD	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors	Wire Size
	12 gauge (4mm ²) stranded maximum
	22 gauge (0.35mm ²) minimum
	3/64 inch (1.2mm) insulation maximum
	(Established by inserted module.) ¹
Category	
Publication	
Installation Instructions	1794-5.16
Agency Certification	
	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

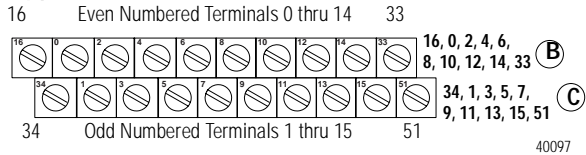
1794-TBNF

Shown with
fuse cover in
the “closed”
position



Wiring




1794-TBNF



ATTENTION



- Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.
- On the 1794-TBNF, only even-numbered terminals 0 through 14 (row B) are fused.

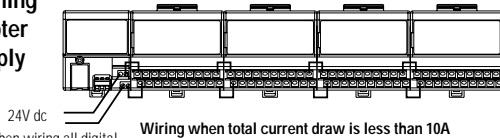
Specifications - 1794-TBNF	
Number of Terminals	2 rows of 10 terminals with cover
Terminal Screw Torque	7-9 inch-pounds
Current Capacity	10A maximum
Voltage Rating	264V ac maximum
Isolation Voltage	Tested at 2500V dc for 1s between user terminals and logic side circuitry Channel-to-channel isolation determined by inserted module.
Fusing	8 - 5x20mm fuses (1 for each even-numbered terminal - 0 through 14 on row B) Shipped with 1.6A, 250V ac Slow Blow fuses suitable for 1794-OA8 ac output module. Refer to individual installation instructions for fusing recommendations for other modules. Littelfuse PN23901.6, A-B PN94171304, SAN-O PNSD6-1.6A
General Specifications	
Dimensions (with module installed in base) HxWxD	94mm x 94mm x 69mm (3.7in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	Operating Non-operating
Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors	Wire Size
	12 gauge (4mm ²) stranded maximum 22 gauge (0.35mm ²) minimum 3/64 inch (1.2mm) insulation maximum (Established by inserted module.) ¹
	Category
Publication	Installation Instructions
Agency Certification	1794-5.17
	  

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, “Industrial Automation Wiring and Grounding Guidelines for Noise Immunity.”

1794-TBN and -TBNF Wiring

Daisy-chaining Using Adapter Power Supply

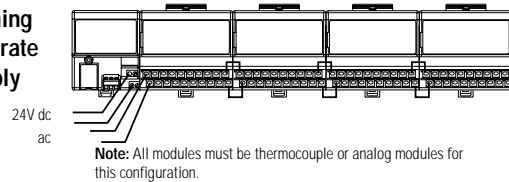
Use this method when wiring all digital modules and total current draw through terminal base units is less than 10A.



42157

Daisy-chaining with a Separate Power Supply

Use this method when wiring all ac digital modules and total current draw through terminal base units is less than 10A.



Note: All modules must be thermocouple or analog modules for this configuration.

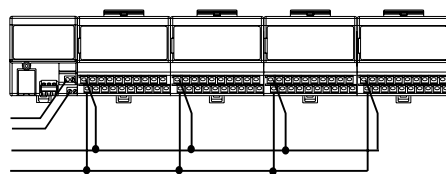
Wiring when total current draw is less than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42158

Individually Powered from Separate Power Supply

¹ = voltage depends on type of module.

24V dc,
120V ac, or
220V ac¹



Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

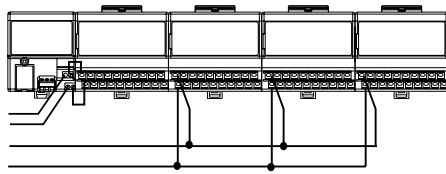
42159

Combination Daisychain and Separate Power Supply

¹ = voltage depends on type of module.

24V dc,
120V ac, or
220V ac¹

Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.



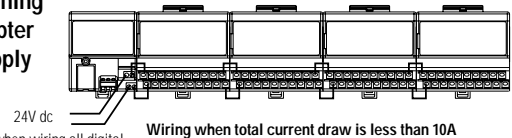
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42160

Alternate Power Input Wiring

Daisy-chaining Using Adapter Power Supply

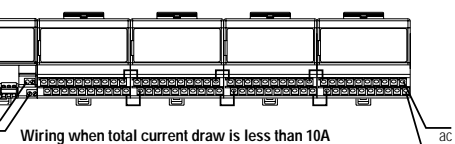
Use this method when wiring all digital modules or all analog modules when total current draw through terminal base units is less than 10A.



42157

Daisy-chaining with a Separate Power Supply

Use this method when wiring all ac digital modules and total current draw through terminal base units is less than 10A.



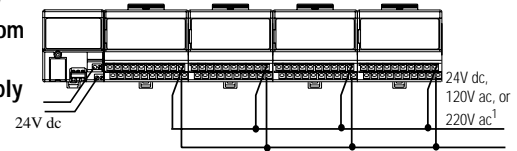
Wiring when total current draw is less than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42161

Individually Powered from Separate Power Supply

¹ = voltage depends on type of module.

24V dc,
120V ac, or
220V ac¹



Wiring when total current draw is greater than 10A
Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

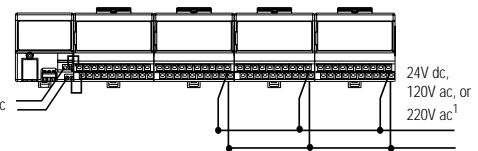
42162

Combination Daisychain and Separate Power Supply

¹ = voltage depends on type of module.

24V dc,
120V ac, or
220V ac¹

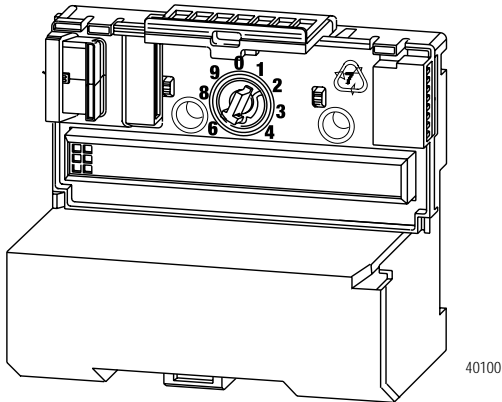
Use this method when wiring both digital and analog modules. Analog modules must be wired separately from "noisy" digital modules.



Separate power supply can be brought in on last module in chain if necessary. Make sure you do not jumper to adapter if using this method.

42163

1203-FB1



If you are using this number of standard (1794) modules:	Then, the maximum number of 1203 modules that you can use is:	And, the number of SCANport connections provided is:
7 or 8	0	0
5 or 6	1	2
3 or 4	2	4
1 or 2	3	6
0	4	8

ATTENTION



- The 1203 FLEX I/O modules that use this base may require up to twice the adapter power supply current of standard FLEX I/O modules. When installing FLEX I/O modules, you can use a maximum of four 1203 modules with any FLEX I/O adapter. As a general rule, each 1203 module requires the power capacity of two of the standard FLEX I/O modules, so you cannot install as many standard modules as you normally would when using the 1203 modules. Refer to the following chart to determine the number of 1203 and standard modules that may be installed together in your system.
- Make certain that the hook on the terminal base you are installing is properly hooked into the adjacent terminal base adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.
- Do not force the terminal base into the adjacent base/adapter. Forcing the units together can bend or break the hook and allow the units to separate and break communication over the backplane.

Wiring





























To wire the 1203-FB1 base, connect a SCANport cable from the SCANport device to the desired channel. SCANport cables are available in either male-to-male or male-to-female configurations. You can connect cables of up to 10 meters (33 feet) between a SCANport device and any SCANport peripheral. If you use a port expander, you must subtract the cable length between any device and the expander from the maximum cable length used to connect a peripheral.

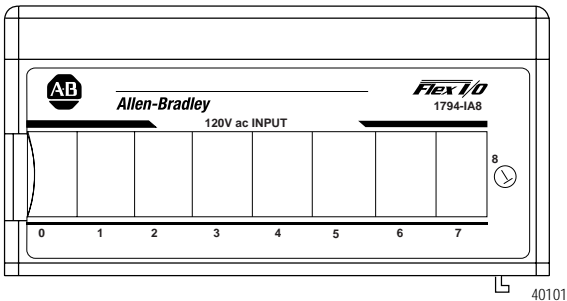
Specifications - 1203-FB1	
I/O Capacity	2 SCANport channels
SCANport Voltage Rating	12V dc +10% to 25%
SCANport Current	60mA per channel
Isolation Voltage	1200V ac/dc FLEX to SCANport channel
SCANport Cable	8-pin circular mini-DIN connector
Keyswitch Position	1
General Specifications	
Dimensions (with module installed in base) HxWxD	79mm x 94mm x 66mm (3.1in x 3.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	
Operating	5 to 80% noncondensing
Non-operating	5 to 95% noncondensing
Shock	
Operating	30g peak acceleration, 11(±1)ms pulse width
Non-operating	50g peak acceleration, 11(±1)ms pulse width
Vibration	
Tested 5g @ 10-500Hz per IEC 68-2-6	
Publication	
Installation Instructions	1203-5.7
Agency Certification	As specified by product label





Use the following table to determine which ac module will meet your application needs.

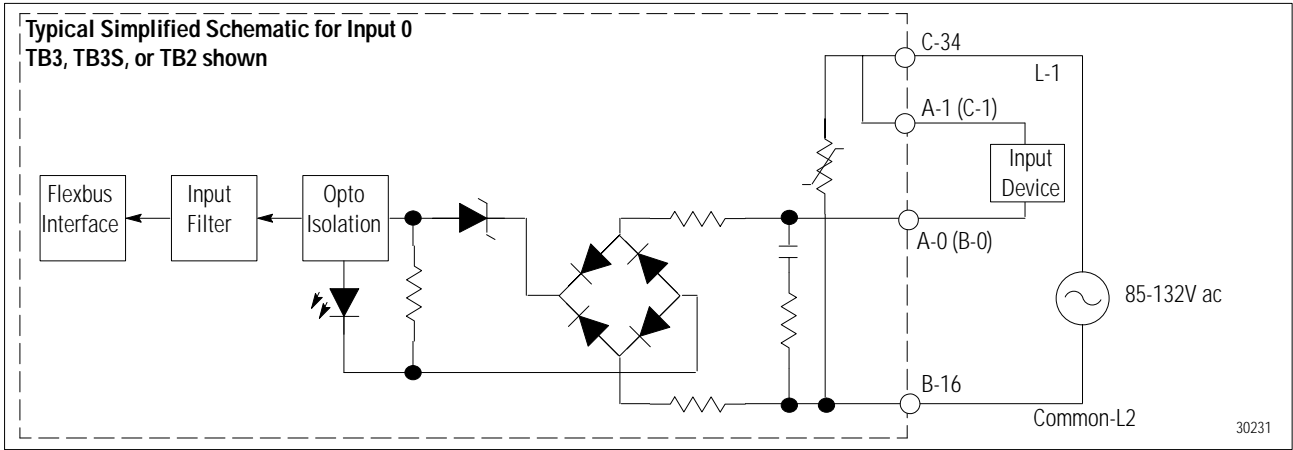
AC Module	Purpose	See Page
<i>1794-IA8</i>	120V ac 8 input module	32
<i>1794-IA8I</i>	120V ac 8 isolated input module	34
<i>1794-IA16</i>	120V ac 16 input module	36
<i>1794-OA8</i>	120V ac 8 output module	38
<i>1794-OA8I</i>	120V ac 8 isolated output module	40
<i>1794-OA16</i>	120V ac 16 output module	42
<i>1794-IM8</i>	220V ac 8 input module	44
<i>1794-OM8</i>	220V ac 8 output module	46

The following table illustrates the recommended terminal base unit(s) for each ac module.

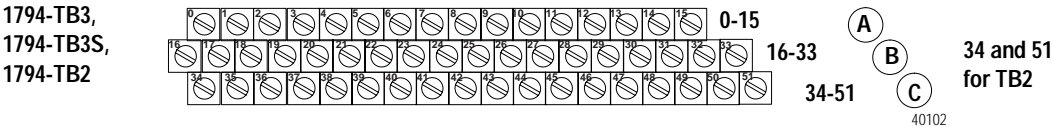
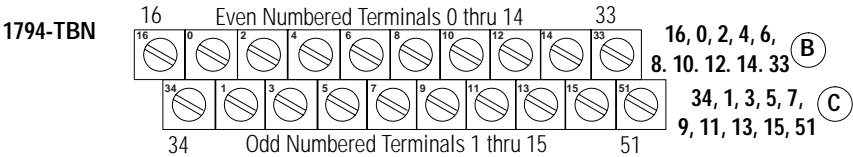
FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
AC			
120V ac Modules	1794-IA8		  
	1794-IA8I		  
	1794-IA16		  Auxiliary terminal strips are required when using the TBN for the IA16
	1794-OA8		   
	1794-OA8I		   
	1794-OA16		   Auxiliary terminal strips are required when using the TBN for the OA16
220V ac Modules	1794-IM8		None
	1794-OM8		



Recommended Terminal Base	Compatible Terminal Base(s)			
				



Wiring



Input Channel	1794-TB3, -TB3S, and -TB2		1794-TBN	
	Input Terminals	120V ac Supply	Input Terminals	120V ac Supply
0	A-0	A-1 ¹ /C-35	B-0	C-1 ²
1	A-2	A-3 ¹ /C-37	B-2	C-3 ²
2	A-4	A-5 ¹ /C-39	B-4	C-5 ²
3	A-6	A-7 ¹ /C-41	B-6	C-7 ²
4	A-8	A-9 ¹ /C-43	B-8	C-9 ²
5	A-10	A-11 ¹ /C-45	B-10	C-11 ²
6	A-12	A-13 ¹ /C-47	B-12	C-13 ²
7	A-14	A-15 ¹ /C-49	B-14	C-15 ²

A = input terminals
B = common terminals
C = Power terminals (C-34 thru 51)

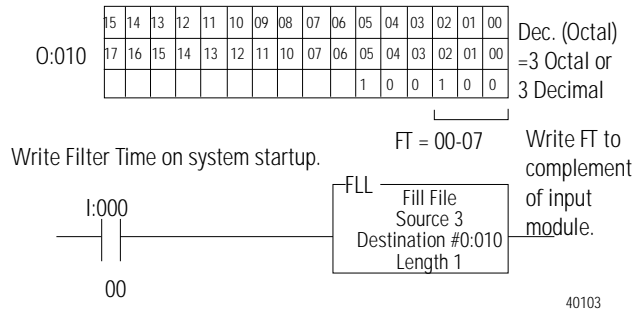
B = even numbered terminals 0 thru 14, ac common terminals 16 and 33
C = Power Terminals C-34 and C-51, and odd numbered terminals 1 thru 15

1 A-1, 3, 5, 7, 9, 11, 13 and 15 on 1794-TB3, -TB3S, and -TB2 are internally connected in the module to 120V ac L1.
2 C-1, 3, 5, 7, 9, 11, 13 and 15 on 1794-TBN are internally connected in the module to 120V ac L1.

Increasing the Input Filter Times

You can increase the input filter time (FT) for channels 00 through 07. Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to increase the off-to-on filter time to 12ms for an ac input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.



Input Filter Times (Standard Mode Addressing Only)

Bits			Description	Selected Filter	Maximum Filter Time	
02	01	00	Filter Time for 00-07		Off to On ¹	On to Off ²
0	0	0	Filter Time 0 (default)	256µs	8.4ms	26.4ms
0	0	1	Filter Time 1	512µs	8.6ms	26.6ms
0	1	0	Filter Time 2	1ms	9ms	27ms
0	1	1	Filter Time 3	2ms	10ms	28ms
1	0	0	Filter Time 4	4ms	12ms	30ms
1	0	1	Filter Time 5	8ms	16ms	34ms
1	1	0	Filter Time 6	16ms	24ms	42ms
1	1	1	Filter Time 7	32ms	40ms	58ms



¹ Off to on filter is 8ms plus additional filter as specified. Refer to specifications.

² On to off filter is 26ms plus additional filter as specified. Refer to specifications.

Specifications - 1794-IA8

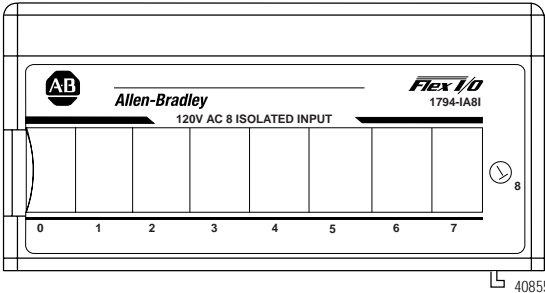
Number of Inputs	8 (1 group of 8), non-isolated
Module Location	Cat. No. 1794-TBN, -TB3, -TB3S, or -TB2 Terminal Base Unit
ON-State Voltage	65V ac minimum
ON-State Current ¹	7.1mA minimum
OFF-State Voltage	43V ac maximum
Maximum OFF-State Current	2.9mA
Nominal Input Impedance	10.6K Ω
Nominal Input Current	12mA @ 120V ac, 60Hz
Isolation Voltage	None
Channel to channel	None
Customer power to input channels	None
User to system	100% tested at 2150V dc for 1s
Maximum Input Filter Time	8.4ms, 8.6ms, 9ms, 10ms, 12ms, 16ms, 24ms, and 40ms
OFF to ON (time from a valid input signal to recognition by module)	
ON to OFF (time from input dropping below valid level to recognition by module)	26.4ms, 26.6ms, 27ms, 28ms, 30ms, 34ms, 42ms, and 58ms
	Filter time selectable thru output image table Default is 8.4ms off to on/26.4 on to off
Flexbus Current (max)	30mA @ 5V dc
Power Dissipation	Maximum 4.5W @ 132V ac
Thermal Dissipation	Maximum 15.3 BTU/hr @ 132V ac
Indicators (field side indication, customer device driven)	8 yellow status indicators
Keyswitch Position	8





General Specifications

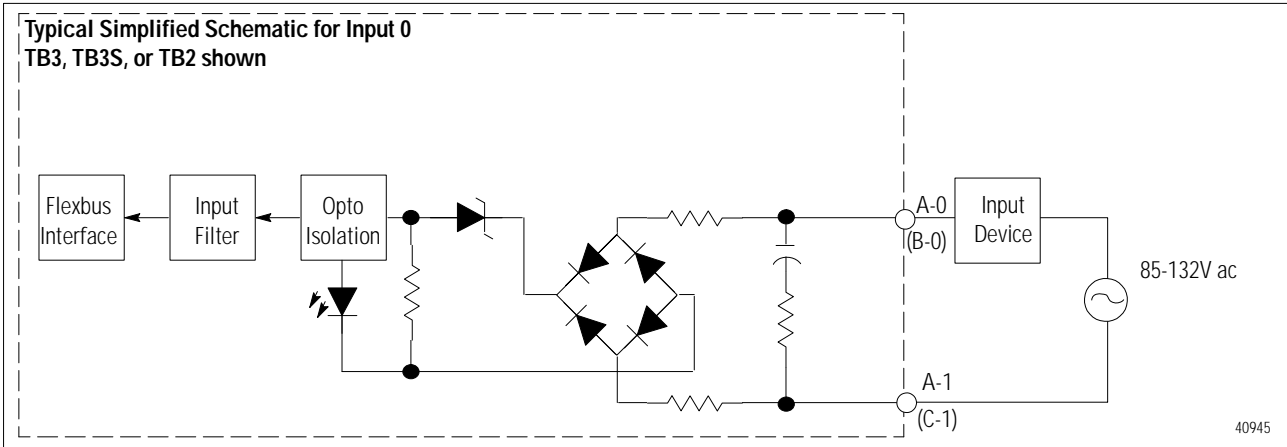
External ac Power Supply Voltage	120V ac nominal
Voltage Range	85 to 132V ac, 47-63Hz
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum
Category	3/64 inch (1.2mm) insulation maximum
Publication Installation Instructions	1794-5.9
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ AC inputs compatible with proximity switches with leakage ratings of $I_{leak} < 2.5mA$ and I_{on} maximum = 5mA.

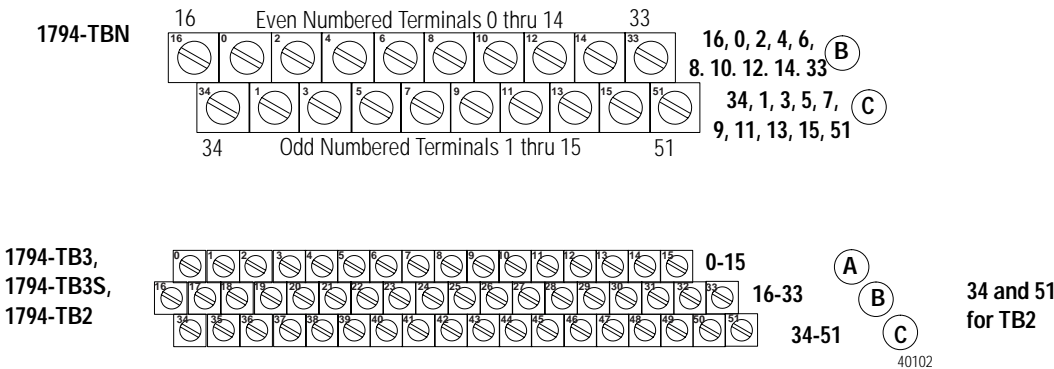
² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)		
			



Wiring



Input Channel	1794-TB3, -TB3S, and -TB2		1794-TBN	
	Input Terminals	120V ac Common L2	Input Terminals	120V ac Common L2
0	A-0	A-1	B-0	C-1
1	A-2	A-3	B-2	C-3
2	A-4	A-5	B-4	C-5
3	A-6	A-7	B-6	C-7
4	A-8	A-9	B-8	C-9
5	A-10	A-11	B-10	C-11
6	A-12	A-13	B-12	C-13
7	A-14	A-15	B-14	C-15

A = even numbered input terminals 0 thru 14 for customer input connections; corresponding odd numbered 120V ac common L2 terminals 1 thru 15 for customer connections from isolated power supply

B = even numbered input terminals 0 thru 14 for customer input connections

C = odd numbered terminals 1 thru 15 for 120V ac L2 common connections from isolated power supply

Increasing the Input Filter Times

You can increase the input filter time (FT) for channels 00 through 07. Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to increase the off-to-on filter time to 12ms for an ac input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.

0:010	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
											1	0	0	1	0	0

Dec. (Octal)
=3 Octal or
3 Decimal

Write Filter Time on system startup.

I:000
00

FLL Fill File
Source 3
Destination #0:010
Length 1

FT = 00-07

Write FT to complement
of input
module.

40103

Input Filter Times (Standard Mode Addressing Only)

Bits			Description	Selected Filter	Maximum Filter Time	
02	01	00	Filter Time for 00-07		Off to On ¹	On to Off ²
0	0	0	Filter Time 0 (default)	256µs	8.4ms	26.4ms
0	0	1	Filter Time 1	512µs	8.6ms	26.6ms
0	1	0	Filter Time 2	1ms	9ms	27ms
0	1	1	Filter Time 3	2ms	10ms	28ms
1	0	0	Filter Time 4	4ms	12ms	30ms
1	0	1	Filter Time 5	8ms	16ms	34ms
1	1	0	Filter Time 6	16ms	24ms	42ms
1	1	1	Filter Time 7	32ms	40ms	58ms




¹ Off to on filter is 8ms plus additional filter as specified. Refer to specifications.

² On to off filter is 26ms plus additional filter as specified. Refer to specifications.

Specifications - 1794-IA8I

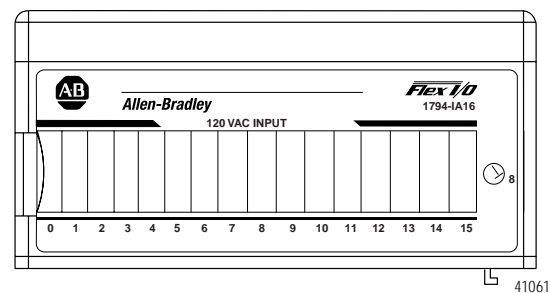
Number of Inputs	8 individually isolated
Module Location	Cat. No. 1794-TBN, -TB3, -TB3S, or -TB2 Terminal Base Unit
ON-State Voltage	65V ac minimum
ON-State Current ¹	7.1mA minimum
OFF-State Voltage	43V ac maximum
Maximum OFF-State Current	2.9mA
Nominal Input Impedance	10.6K Ω
Nominal Input Current	12mA @ 120V ac, 60Hz
Isolation Voltage	100% tested for 1s to 2100V dc between all channels and system; 2100V dc for 1s between individual channels.
Maximum Input Filter Time OFF to ON (time from a valid input signal to recognition by module) ON to OFF (time from input dropping below valid level to recognition by module)	8.4ms, 8.6ms, 9ms, 10ms, 12ms, 16ms, 24ms, and 40ms 26.4ms, 26.6ms, 27ms, 28ms, 30ms, 34ms, 42ms, and 58ms Filter time selectable thru output image table Default is 8.4ms off to on/26.4 on to off
Flexbus Current (max)	30mA @ 5V dc
Power Dissipation	Maximum 4.5W @ 132V ac
Thermal Dissipation	Maximum 15.3 BTU/hr @ 132V ac
Indicators (field side indication, customer device driven)	8 yellow status indicators
Keyswitch Position	8

General Specifications

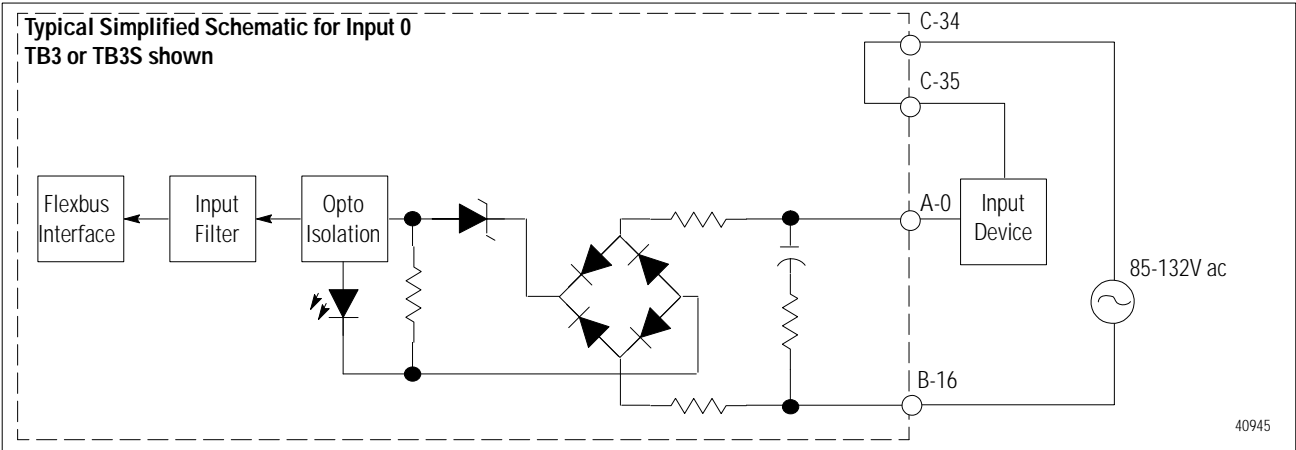
External ac Power Supply Voltage Voltage Range	120V ac nominal 85 to 132V ac, 47-63Hz
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 1 ²
Publication Installation Instructions	1794-5.55
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ AC inputs compatible with proximity switches with leakage ratings of $I_{leak} < 2.5mA$ and $I_{on} maximum = 5mA$.

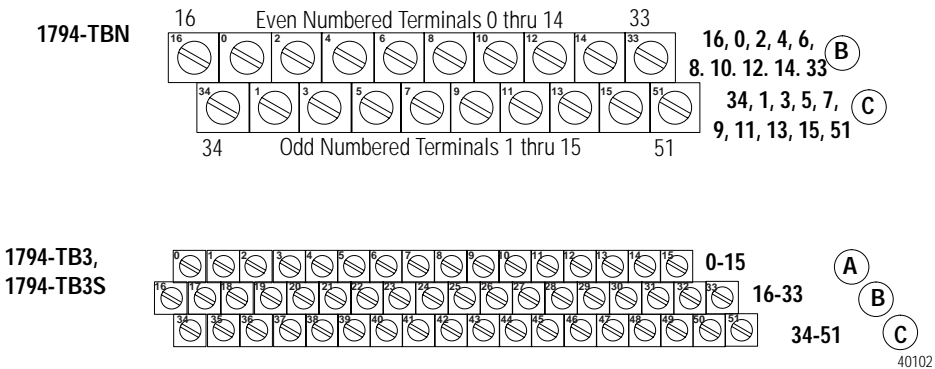
² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)
	Auxiliary terminal strips are required when using the TBN for the IA16



Wiring



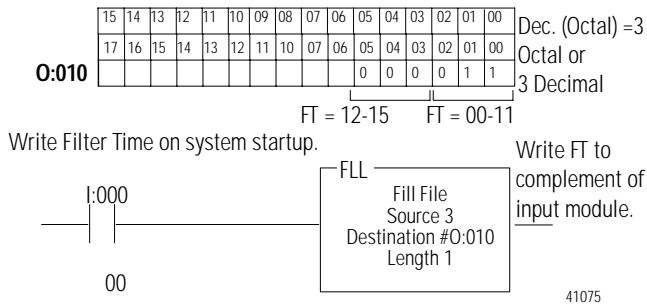
Input Terminals			120V ac Supply	Input Terminals			120V ac Supply
Channel	TB3, TB3S	TBN	TB3, TB3S	Channel	TB3, TB3S	TBN	TB3, TB3S
0	A-0	B-0	C-35	8	A-8	B-8	C-43
1	A-1	C-1	C-36	9	A-9	C-9	C-44
2	A-2	B-2	C-37	10	A-10	B-10	C-45
3	A-3	C-3	C-38	11	A-11	C-11	C-46
4	A-4	B-4	C-39	12	1-12	B-12	C-47
5	A-5	C-5	C-40	13	A-13	C-13	C-48
6	A-6	B-6	C-41	14	A-14	B-14	C-49
7	A-7	C-7	C-42	15	A-15	C-15	C-50

A = Input terminals.
B = B-16 thru B-33 are internally connected together. Connect 120V ac common L2 to B-16.
C = Power terminals (C34 thru 51) are internally connected together. Connect 120V ac L1 to C-34.

Increasing the Input Filter Time

You can increase the input filter time (FT) for channels 00 through 11 and/or channels 12 through 15. Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to increase the off-to-on filter time for inputs 0 through 11 to 10ms for an ac input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.






Input Filter Times

Bits			Description	Maximum Filter Time	
02	01	00	Filter Time for Inputs 00-11	Off to On	On to Off
05	04	03	Filter Time for Inputs 12-15		
0	0	0	Filter Time 0 (default)	7.5ms	26.5ms
0	0	1	Filter Time 1	8ms	27ms
0	1	0	Filter Time 2	9ms	28ms
0	1	1	Filter Time 3	10ms	29ms
1	0	0	Filter Time 4	12ms	31ms
1	0	1	Filter Time 5	16ms	35ms
1	1	0	Filter Time 6	24.5ms	44ms
1	1	1	Filter Time 7	42ms	60.5ms

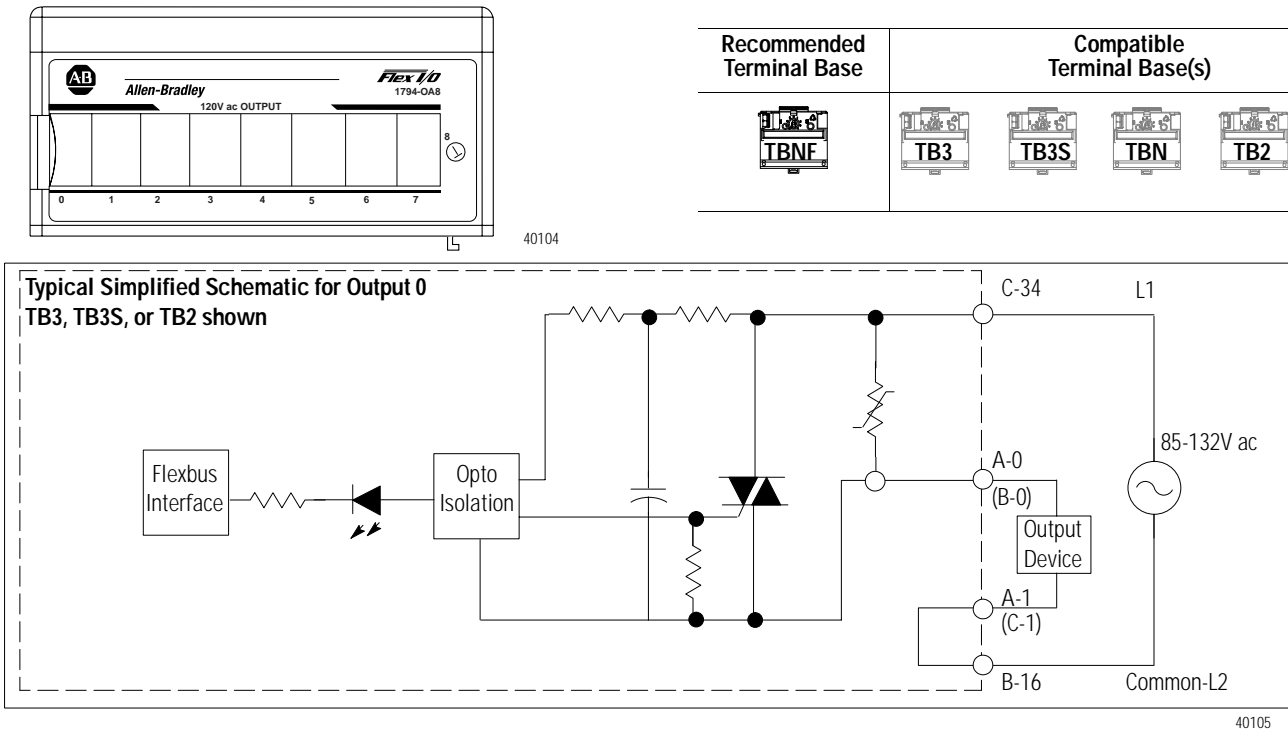
Specifications - 1794-IA16

Number of Inputs	16 non-isolated
Module Location	Cat. No. 1794-TB3, -TB3S, or -TBN Terminal Base Unit
ON-State Voltage Minimum	74V ac, 47Hz
ON-State Current	Minimum Normal Maximum 5.49mA @ 74V ac, 47Hz 12.06mA @ 120V ac, 60Hz 14.81mA @ 132V ac, 63Hz
OFF-State Voltage	20V ac maximum
Maximum OFF-State Current	2.87mA
Nominal Input Impedance	10K Ω
Nominal Input Current	12mA @ 120V ac, 60Hz
Isolation	Channel to Channel Customer Power to Input Channels User to System None required None 100% tested at 2150V dc for 1s
Maximum Input Filter Time	7.5ms, 8ms, 9ms, 10ms, 12ms, 16ms, 24.5ms, and 42ms
OFF to ON (time from a valid input signal to recognition by block)	26.5ms, 27ms, 28ms, 29ms, 31ms, 35ms, 44ms, and 60.5ms
ON to OFF (time from input dropping below valid level to recognition by block)	Filter time selectable thru output image table Default is 7.5ms off to on/26.5 on to off
Flexbus Current (max)	20mA @ 5V dc
Power Dissipation	Maximum 6.4W @ 132V ac
Thermal Dissipation	Maximum 21.8 BTU/hr @ 132V ac
Indicators (field side indication, customer device driven)	16 yellow status indicators
Keyswitch Position	8

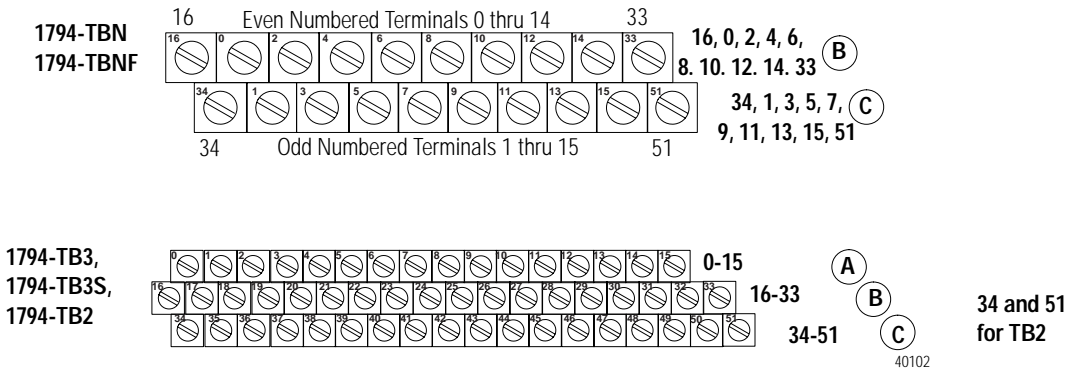
General Specifications

External ac Power Supply Voltage Voltage Range	120V ac nominal 74 to 132V ac, 47-63Hz
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 1 ¹
Publication Installation Instructions	1794-5.60
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Wiring



Output Channel	1794-TB3, -TB3S, and -TB2		1794-TBNF and -TBN	
	Output Terminal	Common Terminal ¹	Output Terminal	Common Terminal ²
0	A-0	A-1 ¹ /B-17	B-0	C-1
1	A-2	A-3 ¹ /B-19	B-2	C-3
2	A-4	A-5 ¹ /B-21	B-4	C-5
3	A-6	A-7 ¹ /B-23	B-6	C-7
4	A-8	A-9 ¹ /B-25	B-8	C-9
5	A-10	A-11 ¹ /B-27	B-10	C-11
6	A-12	A-13 ¹ /B-29	B-12	C-13
7	A-14	A-15 ¹ /B-31	B-14	C-15

A = output terminals
B = common terminals - 120V ac Common L2
C = Power terminals (C-34 thru 51 for TB3 and TB3S) (C-34 and C-51 for TB2)




B = even numbered terminals 0 thru 14, ac common L2 terminals 16 and 33
C = Power Terminals C-34 and C-51, and odd numbered common terminals 1 thru 15

1 A-1, 3, 5, 7, 9, 11, 13 and 15 on 1794-TB3, -TB3S, and -TB2 are connected together inside the module to 120V ac common L2.
2 C-1, 3, 5, 7, 9, 11, 13 and 15 on 1794-TBN and -TBNF are internally connected in the module to 120V ac common L2.

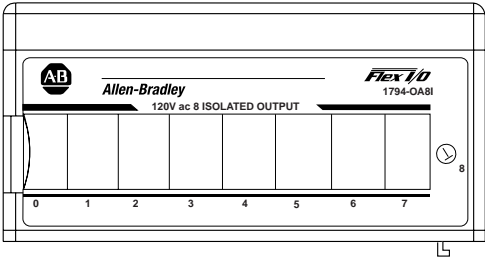
Specifications - 1794-OA8

Number of Outputs	8 (1 group of 8), non-isolated
Module Location	Cat. No. 1794-TBNF, -TB3, -TB3S, -TBN, or -TB2 Terminal Base Unit
Maximum On-State Voltage Drop	1.0V @ 0.5A
ON-State Current	5mA per output minimum 500mA per output maximum @ 55°C (sufficient to operate an A-B Bulletin 500 NEMA size 3 motor starter); 750mA per output maximum @ 35°C; 1.0A on 4 nonadjacent outputs, 500mA on the remaining 4 outputs @ 30°C
OFF-State Leakage	2.25mA maximum
Output Voltage Range	85-132V ac, 47-63Hz
Output Current Rating	4.0A (8 outputs @ 500mA)
Isolation Voltage	1250V ac between user and system No isolation between individual channels; No isolation between customer power and output channels
Output Signal Delay OFF to ON ON to OFF	1/2 cycle maximum 1/2 cycle maximum
Flexbus Current (max)	80mA
Power Dissipation	4.1W max @ 0.5A 6.3W max @ 0.75A 6.3W max @ 1.0A
Thermal Dissipation	14.0 BTU/hr @ 0.5A 21.1 BTU/hr @ 0.75A 21.4 BTU/hr @ 1.0A
Indicators (field side indication, logic driven)	8 yellow status indicators
Keyswitch Position	8
Surge Current	7A for 45ms, repeatable every 8 seconds
Fusing	Use 1.6A, 250V ac Slow-Blow, Littelfuse pt. no. 23901.6; San-O SD6-1.6A; A-B pt. no. 94171304 (The 1794-TBNF fused terminal base comes with SD6-1.6A fuses installed.)

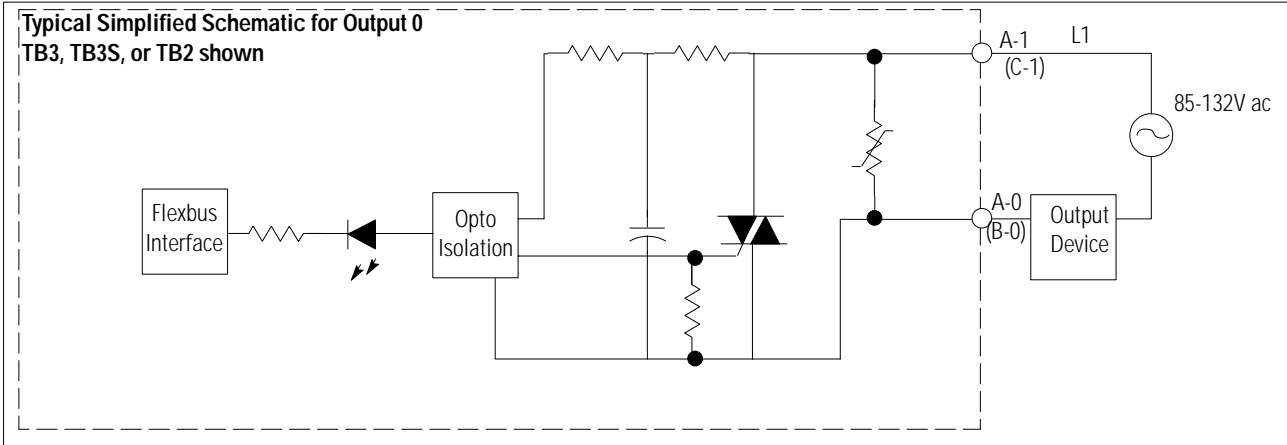
General Specifications

External ac Power Supply Voltage Input Frequency Voltage Range Surge Current Capability	120V ac nominal 47-63Hz 85 to 132V ac Maximum 50A for 1/2 cycle at powerup
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 1 ¹
Publication Installation Instructions	1794-5.10
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

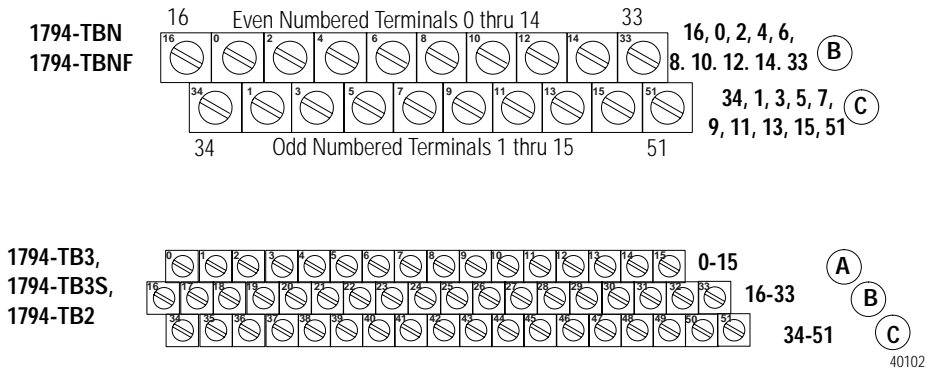
¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)				



Wiring



Output Channel	1794-TB3, -TB3S, and -TB2		1794-TBNF and -TBN	
	Output Terminal	120V ac L1 Terminal	Output Terminal	120V ac L1 Terminal
0	A-0	A-1	B-0	C-1
1	A-2	A-3	B-2	C-3
2	A-4	A-5	B-4	C-5
3	A-6	A-7	B-6	C-7
4	A-8	A-9	B-8	C-9
5	A-10	A-11	B-10	C-11
6	A-12	A-13	B-12	C-13
7	A-14	A-15	B-14	C-15




A = even numbered output terminals 0 thru 14
(odd numbered 120V ac L1 terminals 1 thru 15)

B = even numbered output terminals 0 thru 14
C = odd numbered 120V ac L1 terminals 1 thru 15

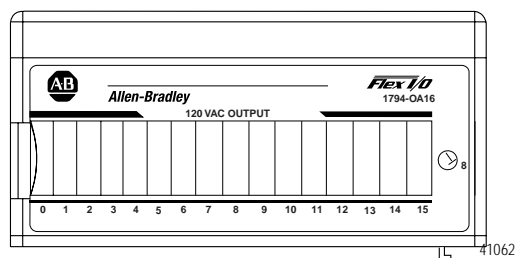
Specifications - 1794-OA8I





Number of Outputs	8 individually isolated
Module Location	Cat. No. 1794-TBNF, -TB3, -TB3S, -TBN, or -TB2 Terminal Base Unit
Maximum On-State Voltage Drop	1.0V @ 0.5A
ON-State Current	5mA per output minimum 500mA per output maximum @ 55°C (sufficient to operate an A-B Bulletin 500 NEMA size 3 motor starter); 750mA per output maximum @ 35°C; 1.0A on 4 nonadjacent outputs, 500mA on the remaining 4 outputs @ 30°C
OFF-State Leakage	2.25mA maximum
Output Voltage Range	85-132V ac, 47-63Hz
Output Current Rating	4.0A (8 outputs @ 500mA)
Isolation Voltage	100% tested at 2100V dc for 1s between all channels and system 2100V dc for 1s between individual channels
Output Signal Delay OFF to ON ON to OFF	1/2 cycle maximum 1/2 cycle maximum
Flexbus Current (max)	80mA
Power Dissipation	4.1W maximum @ 0.5A 6.3W maximum @ 0.75A 6.3W maximum @ 1.0A
Thermal Dissipation	14.0 BTU/hr @ 0.5A 21.1 BTU/hr @ 0.75A 21.4 BTU/hr @ 1.0/0.5A
Indicators (field side indication, logic driven)	8 yellow status indicators
Keyswitch Position	8
Surge Current	7A for 45ms, repeatable every 8 seconds
Fusing	Use 1.6A, 250V ac Slow-Blow, Littelfuse pt. no. 23901.6; San-O SD6-1.6A; A-B pt. no. 94171304 (The 1794-TBNF fused terminal base comes with SD6-1.6A fuses installed.)

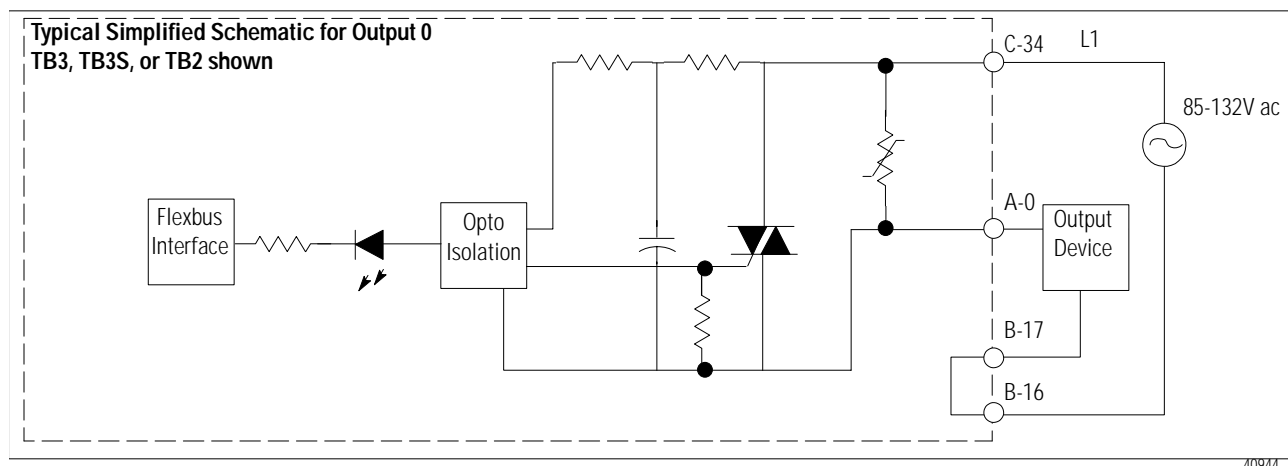
General Specifications

External ac Power Supply Voltage Input Frequency Voltage Range Surge Current Capability	120V ac nominal 47-63Hz 85 to 132V ac Maximum 50A for 1/2 cycle at powerup
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 1 ¹
Publication Installation Instructions	1794-5.56
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

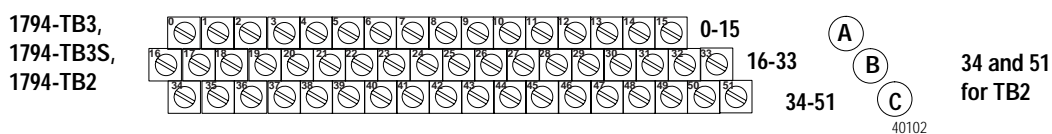
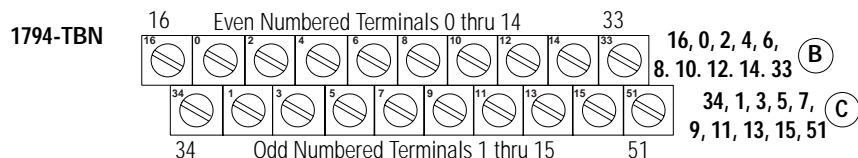
¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)
 <p>TB3</p>	   <p>Auxiliary terminal strips are required when using the TBN</p>



Wiring



	Output Terminals		120V ac Common		Output Terminals		120V ac Common
Channel	TB3, TB3S, TB2	TBN	TB3, TB3S, TB2	Channel	TB3, TB3S, TB2	TBN	TB3, TB3S, TB2
0	A-0	B-0	B-17	8	A-8	B-8	B-25
1	A-1	C-1	B-18	9	A-9	C-9	B-26
2	A-2	B-2	B-19	10	A-10	B-10	B-27
3	A-3	C-3	B-20	11	A-11	C-11	B-28
4	A-4	B-4	B-21	12	1-12	B-12	B-29
5	A-5	C-5	B-22	13	A-13	C-13	B-30
6	A-6	B-6	B-23	14	A-14	B-14	B-31
7	A-7	C-7	B-24	15	A-15	C-15	B-32

For TB3, TB3S, and TB2:

A = Output terminals.

B = B-17 thru B-32 are internally connected together to 120V ac common L2. Connect 120V ac common L2 to B-16.

C = Power terminals (C-34 and C-51 for TB2; C-34 thru C-51 for TB3 and TB3S) are internally connected together. Connect 120V ac L1 to terminal C-34.

For TBN: Connect 120V ac common L2 to B-16. Connect 120V ac L1 to C-34.

B = Even numbered output terminals 0 thru 14.

C = Odd numbered output terminals 1 thru 15.

Specifications - 1794-OA16

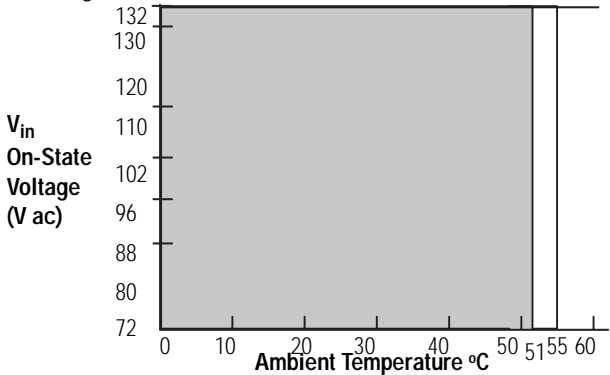
Number of Outputs	16 non-isolated
Module Location	Cat. No. 1794-TB3, -TB3S, -TBN, or -TB2 Terminal Base Unit
Module Mounting	See derating curve
Maximum On-State Voltage Drop	1.5V @ 0.5A
ON-State Current	50mA per output minimum 500mA per output maximum @ 55°C
OFF-State Leakage	2.25mA maximum
Output Voltage Range	74-132V ac, 47-63Hz
Output Current Rating	4.0A (16 outputs @ 250mA) Attention: If using 0.5A outputs, alternate wiring so that no two 0.5A outputs are next to each other.
Isolation Voltage	100% tested at 2150V ac for 1s between all channels and system No isolation between individual channels; No isolation between customer power and output channels
Output Signal Delay OFF to ON ON to OFF	1/2 cycle maximum 1/2 cycle maximum
Flexbus Current (max)	80mA
Power Dissipation	4.7W maximum @ 0.5A
Thermal Dissipation	16.1 BTU/hr @ 0.5A
Indicators (field side indication, logic driven)	16 yellow status indicators
Keyswitch Position	8
Surge Current	7A per module, alternate wiring for 40ms, repeatable every 8 seconds
Fusing	Use 2.5A, 150V ac MQ2 normal fuse

General Specifications

External ac Power Supply Voltage	120V ac nominal
Input Frequency	47-63Hz
Voltage Range	74 to 132V ac
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors	
Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	1 ¹
Publication	
Installation Instructions	1794-5.61
Agency Certification	<div><div><div><div></div></div><div></div></div><div><div><div></div></div><div></div></div><div>Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified</div><div><div></div></div></div>

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

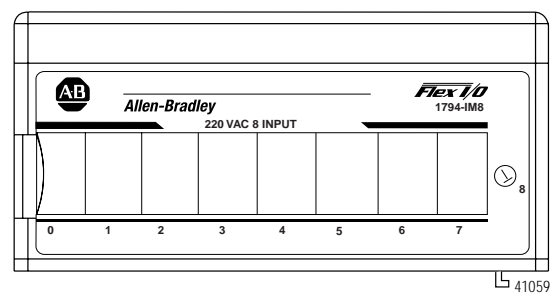



The area within the curve represents the safe operating range for the module under various conditions of user supplied 120V ac supply voltages and ambient temperature

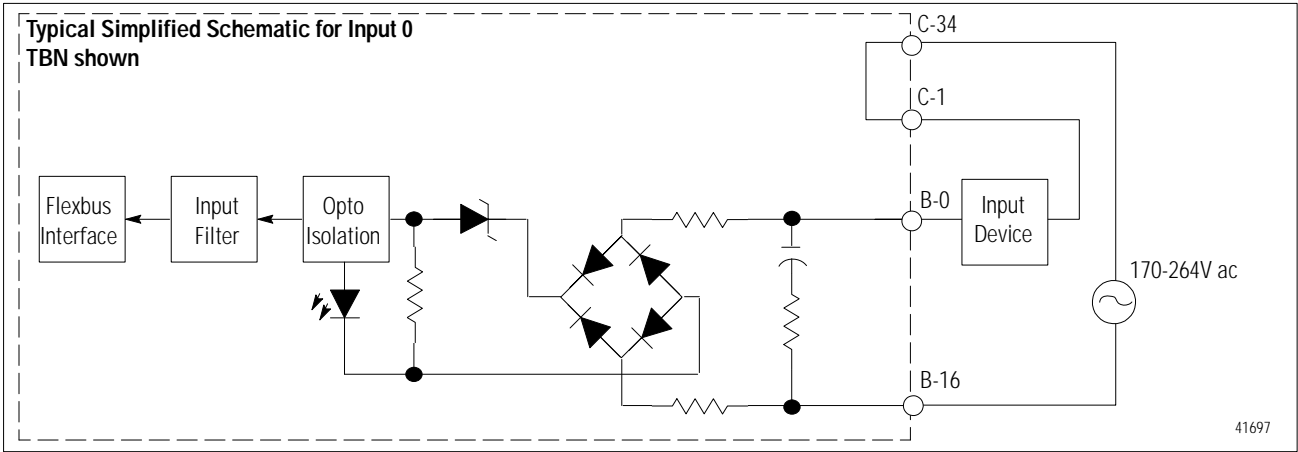
- =Normal mounting safe operating range
- =Other mounting positions (including inverted horizontal, vertical) safe operating range
- Included

41274

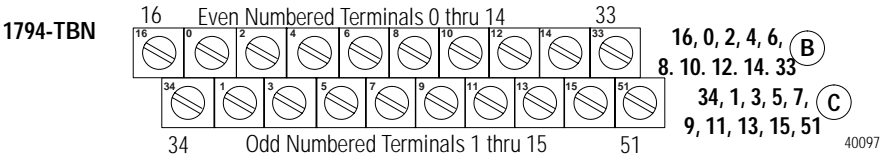
Mounting	Temperature (maximum)
normal horizontal	55°C
Other mounting positions (including inverted horizontal, vertical)	51°C



Recommended Terminal Base	Compatible Terminal Base(s)
	None



Wiring



Input Channel	1794-TBN	
	Input Terminals	220V ac Supply
0	B-0	C-1 ¹
1	B-2	C-3 ¹
2	B-4	C-5 ¹
3	B-6	C-7 ¹
4	B-8	C-9 ¹
5	B-10	C-11 ¹
6	B-12	C-13 ¹
7	B-14	C-15 ¹

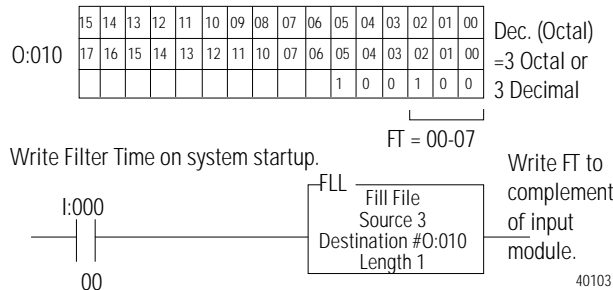
B = even numbered input terminals 0 thru 14, ac common terminals 16 and 33
C = power terminals C-34 and 51, and odd input terminals 1 thru 15

¹ C-1, 3, 5, 7, 9, 11, 13, and 15 on the 1794-TBN are internally connected in the module to 220V ac L1.

Increasing the Input Filter Time

You can increase the filter delay time (FT) for channels 00 through 07. Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to increase the off-to-on filter time to 12ms for an ac input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.



Input Filter Times



Bits			Description	Maximum Filter Time	
02	01	00	Filter Time for Inputs 00-07	Off to On	On to Off
0	0	0	Filter Time 0 (default)	7.5ms	26.5ms
0	0	1	Filter Time 1	8ms	27ms
0	1	0	Filter Time 2	9ms	28ms
0	1	1	Filter Time 3	10ms	29ms
1	0	0	Filter Time 4	12ms	31ms
1	0	1	Filter Time 5	16ms	35ms
1	1	0	Filter Time 6	24.5ms	44ms
1	1	1	Filter Time 7	42ms	60.5ms

Specifications - 1794-IM8

Number of Inputs	8 (1 group of 8), non-isolated
Module Location	Cat. No. 1794-TBN Terminal Base Unit
Module Mounting	See derating curve
ON-State Voltage	159V ac minimum
ON-State Current	Minimum Normal Maximum
	5.27mA @ 159V ac, 47Hz 9.88mA @ 220V ac, 60Hz 13.21mA @ 264V ac, 63Hz
OFF-State Voltage	40V ac maximum
Max OFF-State Current	2.6mA
Nominal Input Impedance	22.3K Ω
Nominal Input Current	10mA @ 220V ac, 60Hz
Isolation	
Channel to Channel	None required
Customer Power to Input Channels	None
User to System	100% tested at 2600V dc for 1s

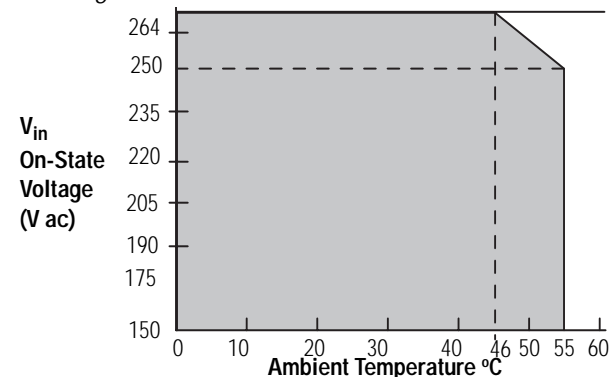
Maximum Input Filter Time	
OFF to ON (time from a valid input signal to recognition by block)	7.5ms, 8ms, 9ms, 10ms, 12ms, 16ms, 24.5ms, and 42ms
ON to OFF (time from input dropping below valid level to recognition by block)	26.5ms, 27ms, 28ms, 29ms, 31ms, 35ms, 44ms, and 60.5ms
	Filter time selectable thru output image table Default is 7.5ms off to on/26.5 on to off
Flexbus Current (max)	30mA @ 5V dc
Power Dissipation	Maximum 4.7W @ 264V ac
Thermal Dissipation	Maximum 16.2 BTU/hr @ 264V ac
Indicators (field side indication, customer device driven)	8 yellow status indicators
Keyswitch Position	8

General Specifications


External ac Power Supply Voltage	220V ac nominal
Voltage Range	159 to 264V ac, 47-63Hz (see derating curve)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors	
Wire Size	12 gauge (4mm ²) stranded maximum
Category	3/64 inch (1.2mm) insulation maximum 1 ¹
Publication	
Installation Instructions	1794-5.57
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

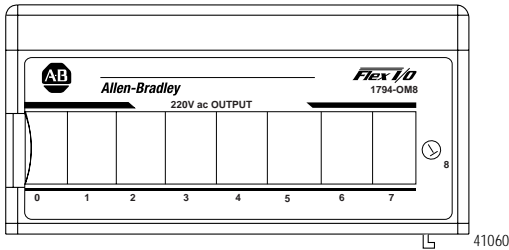




The area within the curve represents the safe operating range for the module under various conditions of user supplied 220V ac supply voltages and ambient temperatures.

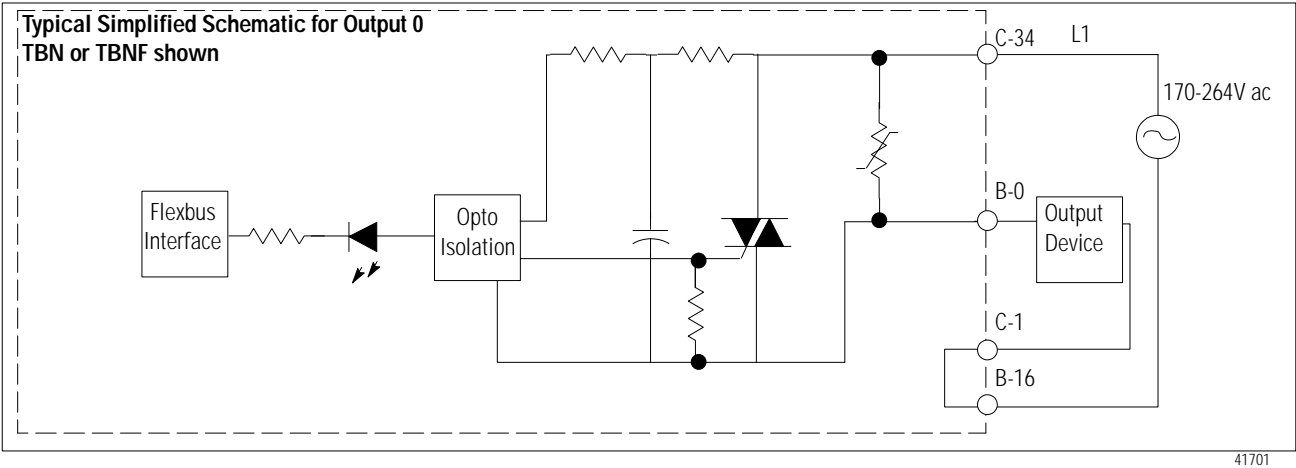
 = All mounting positions (including normal horizontal, vertical, inverted horizontal) safe operating range.

41269

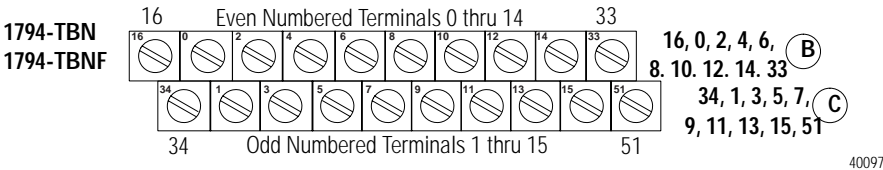
Voltage (maximum)	Temperature (maximum)
264	46°C
250	55°C



Recommended Terminal Base	Compatible Terminal Base(s)
	






Wiring



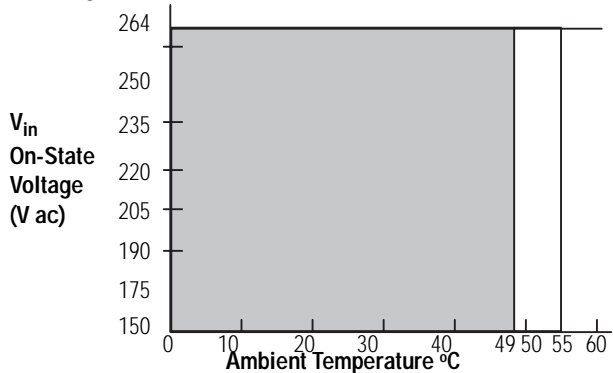
Output Channel	1794-TBN, -TBNF	
	Output Terminal	Common Terminal ¹
0	B-0	C-1
1	B-2	C-3
2	B-4	C-5
3	B-6	C-7
4	B-8	C-9
5	B-10	C-11
6	B-12	C-13
7	B-14	C-15

B = even numbered output terminals 0 thru 14, ac common terminals 16 and 33
C = power terminals C-34 and C-51, and odd numbered output common terminals 1 thru 15
¹ C-1, 3, 5, 7, 9, 11, 13, and 15 are internally connected in the module to 220V ac common L2.




Specifications - 1794-OM8	
Number of Outputs	8 (1 group of 8), non-isolated
Module Location	Cat. No. 1794-TBN or -TBNF Terminal Base Unit
Module Mounting	Refer to derating curve
Maximum On-State Voltage Drop	1.5V @ 0.5A
ON-State Current	50mA per output minimum 500mA per output maximum @ 55°C
OFF-State Leakage	2.5mA maximum
Output Voltage Range	159-264V ac, 47-63Hz
Output Current Rating	4.0A (8 outputs @ 500mA)
Isolation Voltage	100% tested at 2600V ac for 1s between user and system No isolation between individual channels No isolation between customer power and output channels
Output Signal Delay	OFF to ON ON to OFF
Flexbus Current (max)	60mA
Power Dissipation	5W maximum @ 0.5A
Thermal Dissipation	17.1 BTU/hr @ 0.5A
Indicators (field side indication, logic driven)	8 yellow status indicators
Keyswitch Position	8
Surge Current	7A for 40ms, repeatable every 8s
Fusing	Use 0.8A, 250V ac MQ4 normal fuse
General Specifications	
External ac Power Supply Voltage	220V ac nominal
Input Frequency	47-63Hz
Voltage Range	159 to 264V ac (see derating curve)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating Non-operating	50g peak acceleration, 11(±1)ms pulse width
Vibration	Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum
Category	3/64 inch (1.2mm) insulation maximum 1 ¹
Publication Installation Instructions	1794-5.58
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve



The area within the curve represents the safe operating range for the module under various conditions of user supplied 220V ac supply voltages and ambient temperature.

-  =Normal mounting safe operating range  Included
 =Other mounting positions (including inverted horizontal, vertical) safe operating range

41270
































Mounting	Temperature (maximum)
normal horizontal	55°C
Other mounting positions (including inverted horizontal, vertical)	49°C

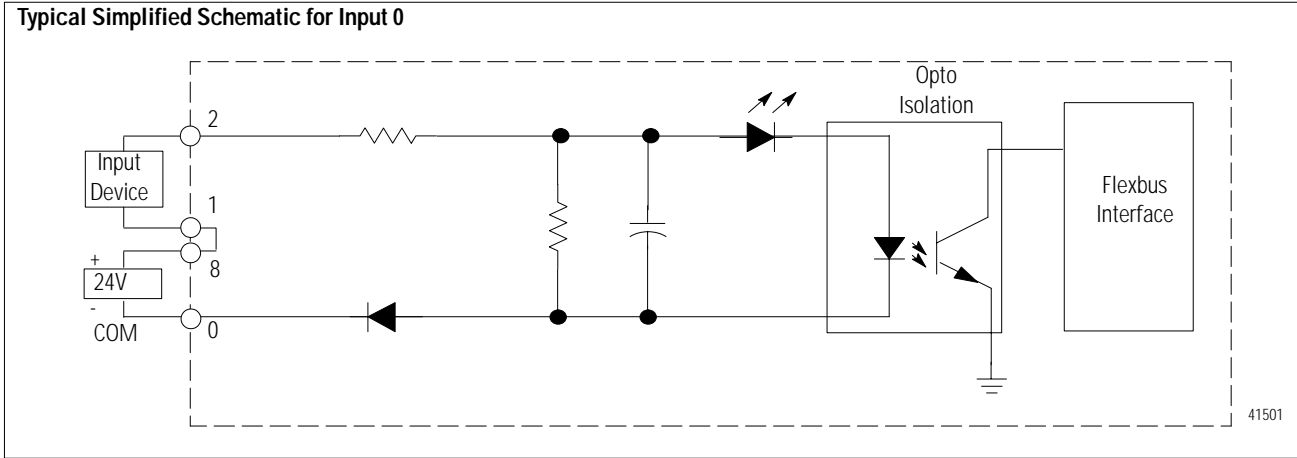
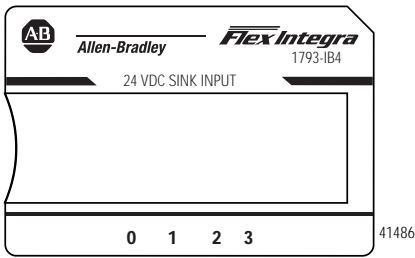
Use the following table to determine which dc module will meet your application needs.

DC Module	Purpose	See Page
<i>FLEX Integra</i> 1793-IB4, -IB4S	24V dc 4 sink input module - 1793-IB4 has screw-clamp terminations; the 1793-IB4S has spring-clamp terminations	51
1793-IB16, -IB16S	24V dc 16 sink input module - 1793-IB16 has screw-clamp terminations; the 1793-IB16S has spring-clamp terminations	53
1793-IV16, -IV16S	24V dc 16 source input module - 1793-IV16 has screw-clamp terminations; the 1793-IV16S has spring-clamp terminations	55
1793-OB4P, -OB4PS	24V dc 4 protected source output module - the 1793-OB4P has screw-clamp terminations; the 1793-OB4PS has spring-clamp terminations	57
1793-OB16P, -OB16PS	24V dc 16 protected source output module - the 1793-OB16P has screw-clamp terminations; the 1793-OB16PS has spring-clamp terminations	59
1793-OV16P, -OV16PS	24V dc 16 protected sink output module - the 1793-OV16P has screw-clamp terminations; the 1793-OV16PS has spring-clamp terminations	61
1793-IB2XOB2P, -IB2XOB2PS	24V dc 2 sink input/2 protected output combo module - the 1793-IB2XOB2P has screw-clamp terminations; the 1793-IB2XOB2PS has spring-clamp terminations	63

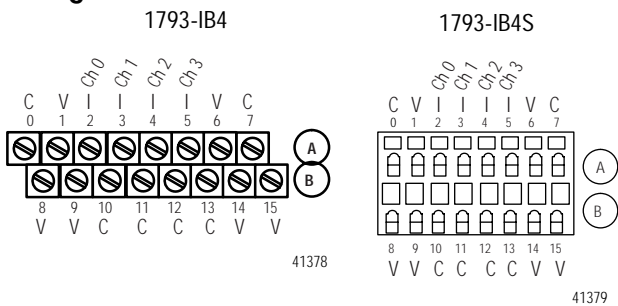
DC Module	Purpose	See Page
<i>FLEX I/O</i> 1794-IB8	24V dc 8 sink input module	65
1794-IB16	24V dc 16 sink input module	67
1794-IV16	24V dc 16 source input module	69
1794-OB8	24V dc 8 source output module	71
1794-OB16	24V dc 16 source output module	73
1794-OB16P	24V dc 16 source output (protected) module	75
1794-OV16	24V dc 16 sink output module	77
1794-OV16P	24V dc 16 sink output (protected) module	79
1794-OB8EP	24V dc electronically fused 8 source output module	81
1794-IB10XOB6	24V dc 10 sink input/6 2A output combo module	83
1794-IC16	48V dc 16 sink input module	86
1794-OC16	48V dc 16 source output module	88

The following table illustrates the recommended terminal base unit(s) for each dc module.

FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
24V dc Modules	1794-IB8		
	1794-IB16		
	1794-IV16		 
	1794-OB8		 
	1794-OB16		 
	1794-OB16P		 
	1794-OV16		
	1794-OV16P		
	1794-OB8EP		  
	1794-IB10XOB6		
48V dc Modules	1794-IC16		
	1794-OC16		 



Wiring



Where: C = common, V = +24V dc power, I =input

Channel	Input Terminal ¹	Supply Terminal
Input 0	A-2	A-1
Input 1	A-3	A-6
Input 2	A-4	B-9
Input 3	A-5	B-14
+24V dc	Terminals 1, 6, 8, 9, 14, 15 are internally connected together in the module	
Common	Terminals 0, 7, 10 thru 13 are internally connected together in the module	

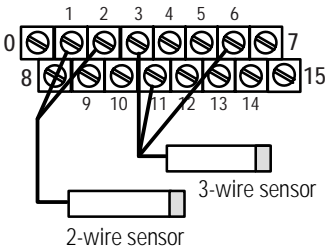
¹ 2-wire sensors use input and supply terminals; 3-wire sensors use input, supply and common terminals.

ATTENTION



Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

Example of 2-Wire and 3-Wire Sensors



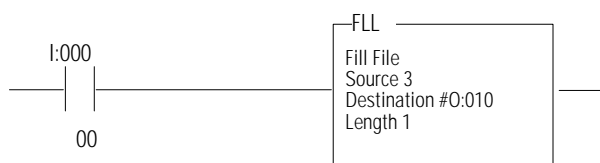
Setting Input Filter Times (Standard Mode Addressing Only)

You can select the input filter time (FT) for channels 00 thru 03. Select the input filter time by setting the corresponding bits in the output image table (complementary word) for the module.

For example, to set a filter time of 2ms for an input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec.=3
0:010														0	1	1	Octal or 3 Decimal

Write Filter Time on system startup.



Write Filter Time to complement of input module.

41335

Input Filter Times

Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-07	
0	0	0	Filter Time 0 (default)	256µs
0	0	1	Filter Time 1	512µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

Specifications - 1793-IB4 and -IB4S

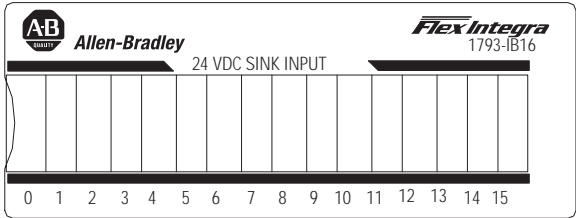
Number of Channels	1 group of 4, nonisolated
Module Location	DIN-rail mounted
Module Type	4 digital input - sinking 1793-IB4 - screw-clamp terminations 1793-IB4S - spring-clamp terminations
ON-State Voltage	10-31.2V dc; 24V dc nominal
ON-State Current	2-12mA; 8mA @ 24V dc
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Channel Impedance	4.6K Ω
Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - none
Maximum Input Filter Times	OFF to ON ON to OFF 256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current	10mA maximum
Power Dissipation	1.5W @ 31.2V dc
Thermal Dissipation	5.1 BTU/hr @ 31.2V dc
Indicators	4 yellow channel status indicators

General Specifications

External dc Power Voltage	19.2-31.2V dc (5% ac ripple)
Dimensions HxWxD	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	Operational Temperature Storage Temperature Relative Humidity Shock Vibration
Conductors	Wire Size Category
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.1
Agency Certification	

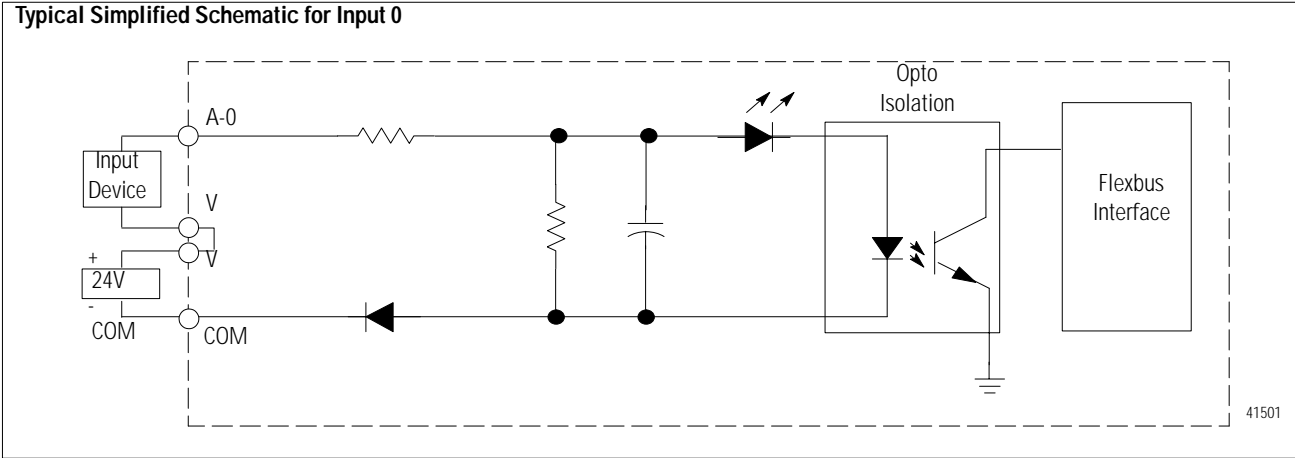


¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



41812

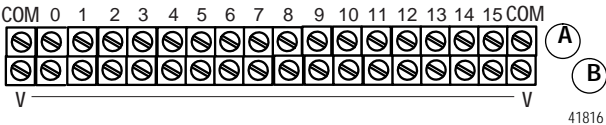
Typical Simplified Schematic for Input 0



41501

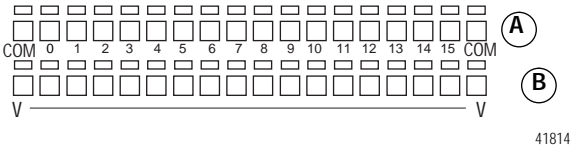
Wiring

1793-IB16



41816

1793-IB16S



41814

Where: C = common, V = +24V dc power, 0-15 = inputs

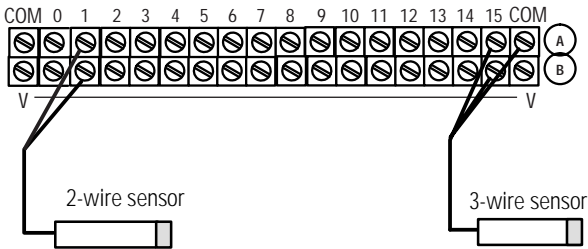
Channel	Input	Common	Channel	Input	Common
0	A-0	connect to corresponding terminal on row B	8	A-8	connect to corresponding terminal on row B
1	A-1		9	A-9	
2	A-2		10	A-10	
3	A-3		11	A-11	
4	A-4		12	A-12	
5	A-5		13	A-13	
6	A-6		14	A-14	
7	A-7		15	A-15	
+24V dc	Power terminals V are internally connected together in the module.				
24V dc common	Common terminals COM are internally connected together in the module.				

ATTENTION



Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

Example of 2-Wire and 3-Wire Sensors



41818

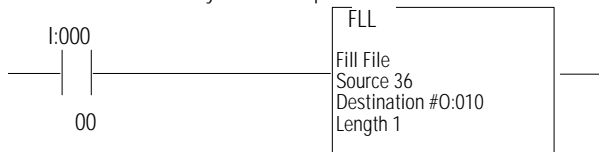
Setting Input Filter Times

You can select the input filter time (FT) for channels 00 thru 11 and channels 12 thru 15. Select the input filter time by setting the corresponding bits in the output image table (complementary word) for the module.

For example, to set a filter time of 4ms for an input module at address rack 1, module group 0, set bits 05, 04, 03, 02, 01, and 00 as shown below.

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec.=
0:010											1	0	0	1	0	0	44 Octal
											FT 12-15			FT 00-11			or 36
																	Decimal

Write Filter Time on system startup.



Write Filter Time to complement of input module.

41335

Input Filter Times

Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-03	
0	0	0	Filter Time 0 (default)	256µs
0	0	1	Filter Time 1	512µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

Specifications - 1793-IB16 and -IB16S

Number of Channels	16 (1 group of 16, nonisolated, sinking)
Module Location	DIN-rail mounted
Module Type	16 digital input - sinking 1793-IB16 - screw-clamp terminations 1793-IB16S - spring-clamp terminations
ON-State Voltage	10V dc minimum 24V dc nominal 31.2V dc maximum
ON-State Current	2mA minimum 8.8mA nominal at 24V dc 12.1mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	2.5K Ω
Dielectric Withstand Test	100% tested at 1900V dc for 1s between user and system No isolation between individual channels

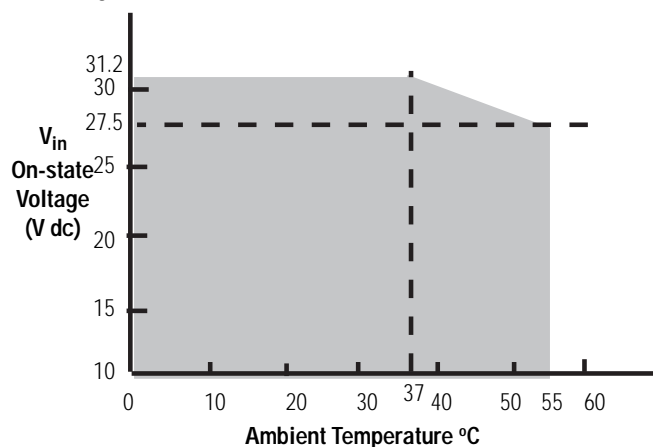
Maximum Input Filter Times (Selectable) OFF to ON ON to OFF	256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current	25mA maximum
Power Dissipation	6.1W @ 31.2V dc
Thermal Dissipation	20.8 BTU/hr @ 31.2V dc
Indicators	16 yellow channel status indicators

General Specifications

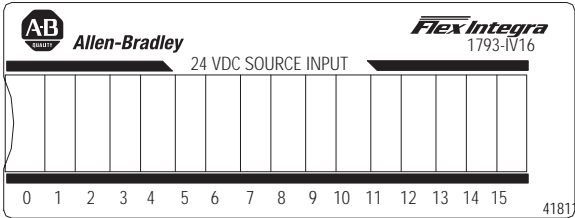
External dc Power Voltage	19.2-31.2V dc (5% ac ripple)
Dimensions HxWxD	69mm x 94mm x 80mm (2.72in x 3.7in x 3.2in)
Environmental Conditions	0 to 55°C (32 to 131°F)
Operational Temperature	-40 to 85°C (-40 to 185°F)
Storage Temperature	5 to 95% noncondensing
Relative Humidity	30g peak acceleration, 11(±1)ms pulse width
Shock	50g peak acceleration, 11(±1)ms pulse width
Operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Non-operating	
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.8
Agency Certification	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

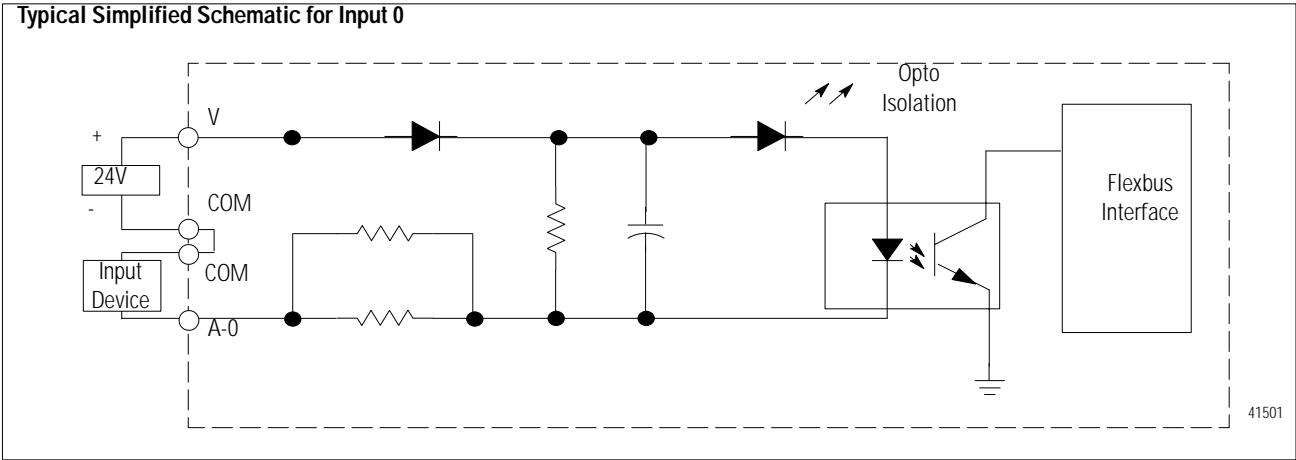
Derating Curve



41820

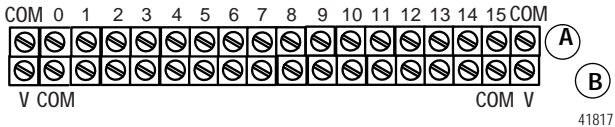


Typical Simplified Schematic for Input 0

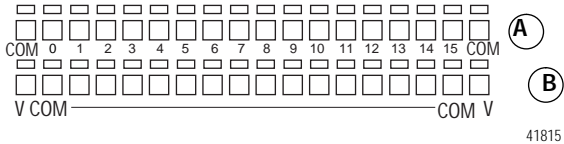


Wiring

1793-IV16



1793-IV16S



Where: C = common, V = +24V dc power, 0-15 = inputs

Channel	Input	Common	Channel	Input	Common
0	A-0	connect to corresponding terminal on row B	8	A-8	connect to corresponding terminal on row B
1	A-1		9	A-9	
2	A-2		10	A-10	
3	A-3		11	A-11	
4	A-4		12	A-12	
5	A-5		13	A-13	
6	A-6		14	A-14	
7	A-7		15	A-15	
+24V dc	Power terminals V are internally connected together in the module.				
24V dc common	Common terminals COM are internally connected together in the module.				

ATTENTION

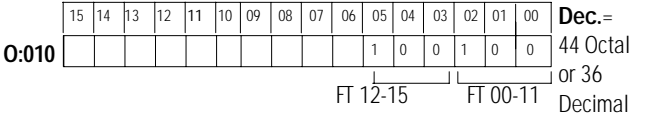


Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

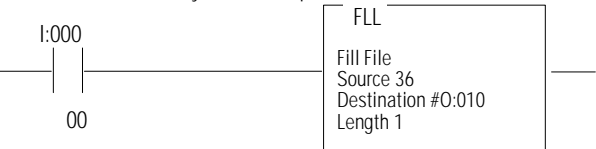
Setting Input Filter Times

You can select the input filter time (FT) for channels 00 thru 11 and channels 12 thru 15. Select the input filter time by setting the corresponding bits in the output image table (complementary word) for the module.

For example, to set a filter time of 4ms for an input module at address rack 1, module group 0, set bits 05, 04, 03, 02, 01, and 00 as shown below.



Write Filter Time on system startup.



Write Filter Time to complement of input module.

41335


Input Filter Times

Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-11	
05	04	03	Filter Time for Inputs 12-15	
0	0	0	Filter Time 0 (default)	256μs
0	0	1	Filter Time 1	512μs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

Specifications - 1793-IV16 and -IV16S

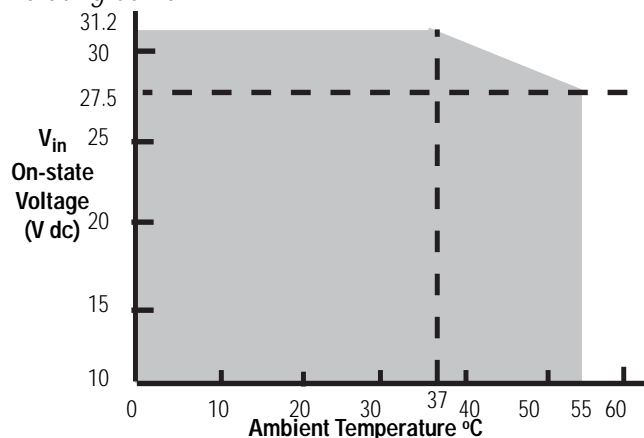
Number of Channels	1 group of 16, nonisolated, sourcing
Module Location	DIN-rail mounted
Module Type	16 digital input - sourcing 1793-IV16 - screw cage terminations 1793-IV16S - spring clamp terminations
ON-State Voltage	10V dc minimum 24V dc nominal 31.2V dc maximum
ON-State Current	2mA minimum 8.8mA nominal @ 24V dc 12.1mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	2.5K Ω
Dielectric Withstand Test	100% tested at 1900V dc for 1s between user and system No isolation between individual channels
Maximum Input Filter Times (selectable)	
OFF to ON	256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms
ON to OFF	256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256μs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current	25mA maximum
Power Dissipation	6.1W @ 31.2V dc
Thermal Dissipation	20.8 BTU/hr @ 31.2V dc
Indicators	16 yellow channel status indicators

General Specifications

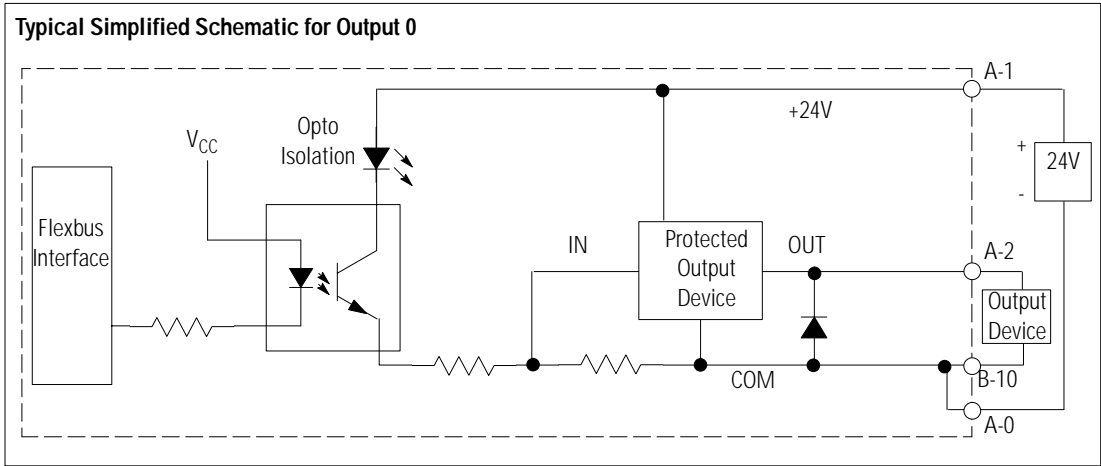
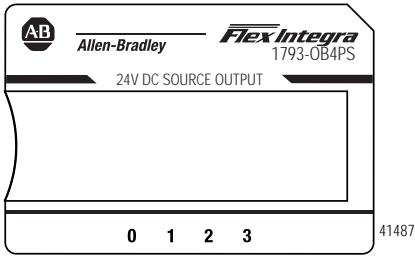
External dc Power Voltage	19.2-31.2V dc (5% ac ripple)
Dimensions HxWxD	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating Non-operating Vibration	50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.10
Agency Certification	

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

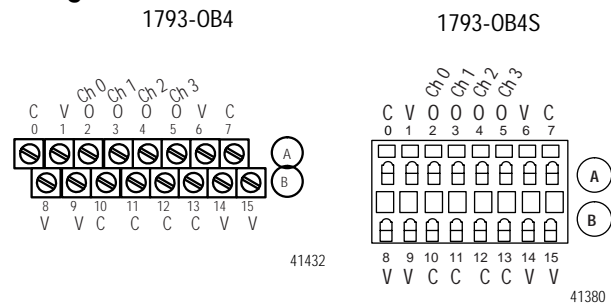
Derating Curve



41820



Wiring




Output	Output Terminal	Common Terminal
Output 0	A-2	B-10
Output 1	A-3	B-11
Output 2	A-4	B-12
Output 3	A-5	B-13
+24V dc	Terminals 1, 6, 8, 9, 14, 15 are internally connected together in the module	
Common	Terminals 0, 7, 10 thru 13 are internally connected together in the module	

ATTENTION



Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

Specifications - 1793-OB4P and -OB4PS	
Number of Channels	1 group of 4, nonisolated
Module Location	DIN-rail mounted
Module Type	4 digital output - sourcing, protected 1793-OB4P - screw-clamp terminations 1793-OB4PS - spring-clamp terminations
ON-State Voltage	10-31.2V dc; 24V dc nominal
ON-State Current	1-500mA per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Current	0.5mA maximum leakage
Channel Impedance	1.0 Ω (0.5v maximum drop)
Surge Current	1.5A for 50ms, repeatable every 2s
Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - none
Maximum Input Delay Times	
OFF to ON	0.5ms maximum
ON to OFF	1.0ms maximum
Flexbus Current	20mA maximum
Power Dissipation	1.3W @ 31.2V dc
Thermal Dissipation	4.4 BTU/hr @ 31.2V dc
Indicators	4 yellow channel status indicators

General Specifications	
External dc Power	
Voltage	19.2-31.2V dc (5% ac ripple)
Current	80mA
Dimensions HxWxD	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication	
Installation Instructions	1793-5.2
Agency Certification	
	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



1793-OB16




41815

Channel	Output	Common	Channel	Output	Common
0	A-0	connect to corresponding terminal on row B	8	A-8	connect to corresponding terminal on row B
1	A-1		9	A-9	
2	A-2		10	A-10	
3	A-3		11	A-11	
4	A-4		12	A-12	
5	A-5		13	A-13	
6	A-6		14	A-14	
7	A-7		15	A-15	
+24V dc	Power terminals V are internally connected together in the module.				
24V dc common	Common terminals COM are internally connected together in the module.				

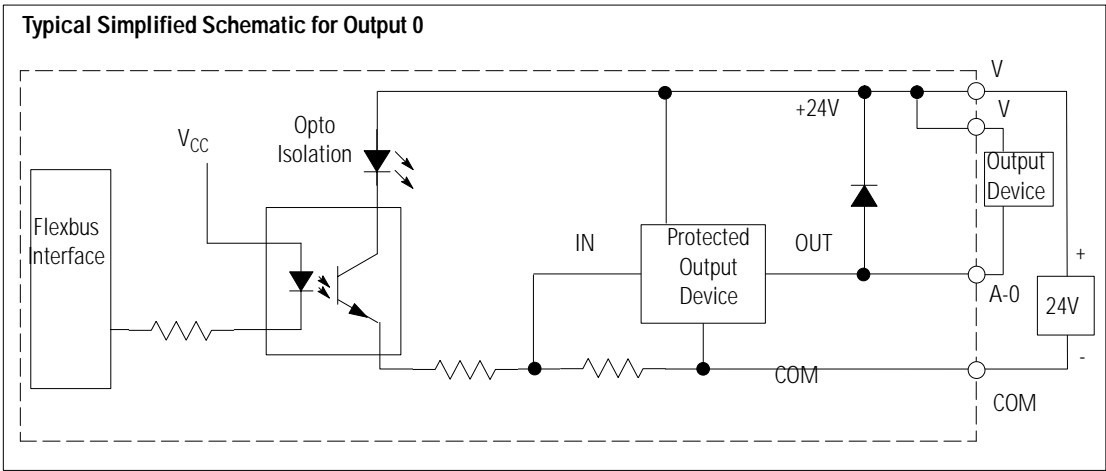
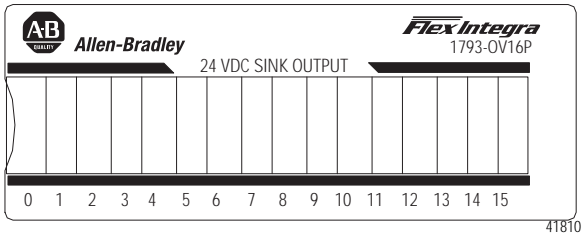
Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.



Specifications - 1793-OB16P and -OB16PS	
Number of Channels	16 (1 group of 16, nonisolated)
Module Location	DIN-rail mounted
Module Type	16 digital output - sourcing, protected 1793-OB16P - screw-clamp terminations 1793-OB16PS - spring-clamp terminations
ON-State Voltage	10V dc minimum 24V dc nominal 31.2V dc maximum
ON-State Current	1mA minimum per channel 500mA maximum per channel
OFF-State Voltage Drop	0.5V dc maximum
OFF-State Leakage	0.5mA maximum leakage
Surge Current	1.5A for 50ms, repeatable every 2s
Dielectric Withstand Test	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Maximum Input Delay Times OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current	80mA maximum
Power Dissipation	5W @ 31.2V dc
Thermal Dissipation	17 BTU/hr @ 31.2V dc
Indicators	16 yellow channel status indicators

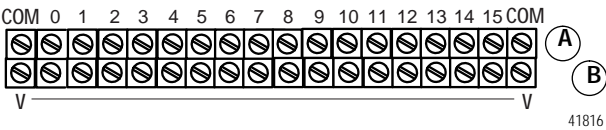
General Specifications	
External dc Power Voltage Current	19.2-31.2V dc (5% ac ripple) 80mA
Dimensions HxWxD	69mm x 94mm x 80mm (2.72in x 3.7in x 3.20in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.9
Agency Certification	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

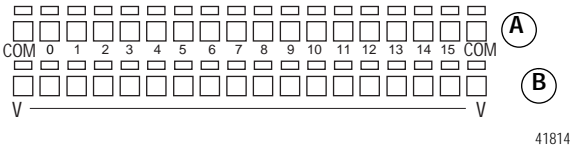


Wiring

1793-OV16P



1793-OV16PS




Where: C = common, V = +24V dc power, 0-15 = outputs

Channel	Output	Power	Channel	Output	Power
0	A-0	Connect to corresponding terminal on row B	8	A-8	Connect to corresponding terminal on row B
1	A-1		9	A-9	
2	A-2		10	A-10	
3	A-3		11	A-11	
4	A-4		12	A-12	
5	A-5		13	A-13	
6	A-6		14	A-14	
7	A-7		15	A-15	
+24V dc	Power terminals V are internally connected together in the module.				
24V dc common	Common terminals COM are internally connected together in the module.				

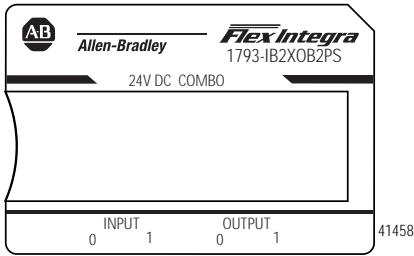
ATTENTION

Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

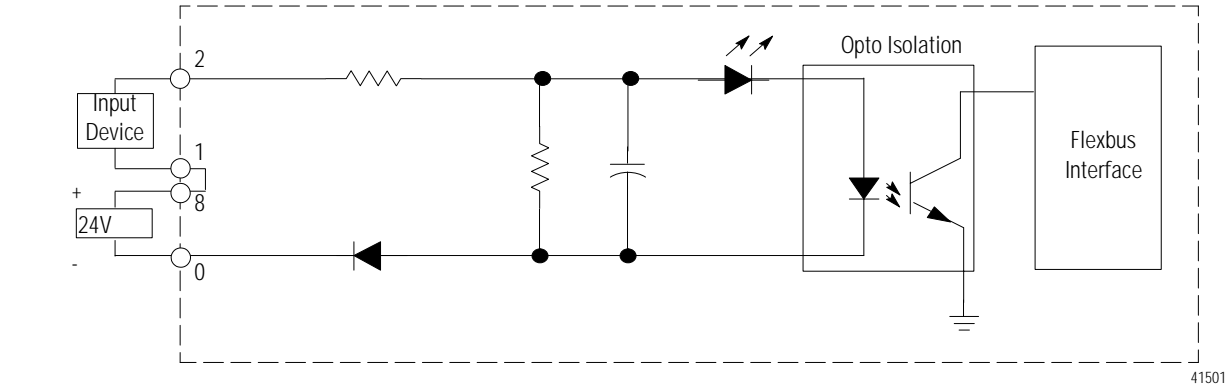
Specifications - 1793-OV16P and -OV16PS	
Number of Channels	1 group of 16, nonisolated, sinking
Module Location	DIN-rail mounted
Module Type	16 digital output - sinking, protected 1793-OV16P - screw-clamp terminations 1793-OV16PS - spring-clamp terminations
ON-State Voltage	10V dc minimum 24V dc nominal 31.2V dc maximum
ON-State Current	1mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Current	0.5mA maximum leakage
Surge Current	2A for 50ms, repeatable every 2s
Dielectric Withstand Test	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Maximum Output Signal Delay Times OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current	80mA maximum
Power Dissipation	4.2W @ 31.2V dc
Thermal Dissipation	14.3 BTU/hr @ 31.2V dc
Indicators	16 yellow channel status indicators
Fusing	Outputs are electronically protected

General Specifications	
External dc Power Voltage Current	19.2-31.2V dc (5% ac ripple) 80mA
Dimensions HxWxD	69mm x 94mm x 80mm (2.72in x 3.7in x 3.2in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.11
Agency Certification	

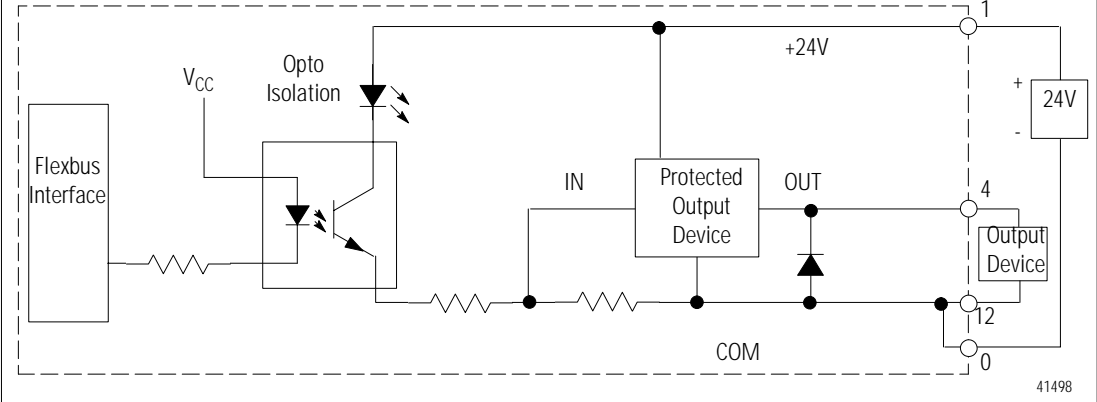
¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



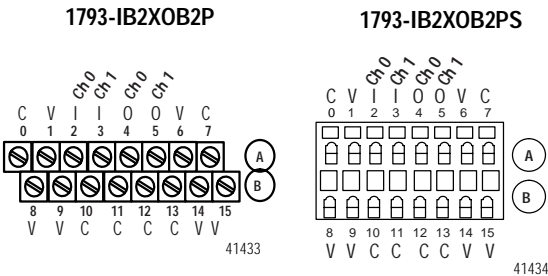
Typical Simplified Schematic for Input 0



Typical Simplified Schematic for Output 0



Wiring



Where: C = common, V = +24V dc power, I =input, O = output

ATTENTION

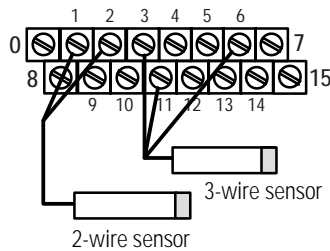


Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.

Input ¹	Input Type	Input Terminal	Supply Terminal
0	Sink Input	2	1
1	Sink Input	3	6
Output	Output Type	Output Terminal	Common
0	Source Output	4	12
1	Source Output	5	13
+24V dc	Terminals 1, 6, 8, 9, 14, 15 are internally connected together in the module.		
24V dc common	Terminals 0, 7, 10 thru 13 are internally connected together in the module		

1 Two wire devices use input, supply terminals, 3-wire devices use input, supply and common.

Example of 2-Wire and 3-Wire Sensors



41338

Setting Input Filter Time (Standard Addressing Mode Only)

(not available when used with the 1794-ASB adapter)

You can select the input filter time (FT) for channels 00 and 01. Select the input filter time by setting the corresponding bits in the configuration word (word 3) for the module.

For example, to set a filter time of 4ms for an input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec.=4
0:010														1	0	0	Octal or 4
																	Decimal
																	FT = 00-07

Write Filter Time on system startup.



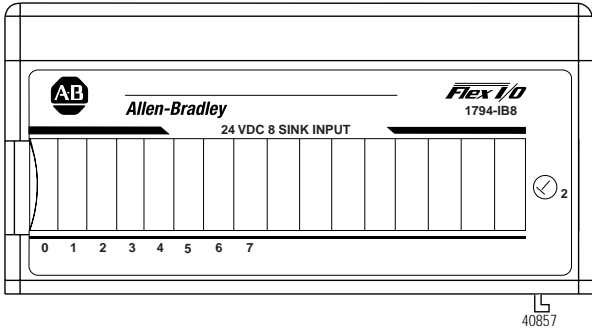
Write Filter Time Constant to complement of input module.

40609

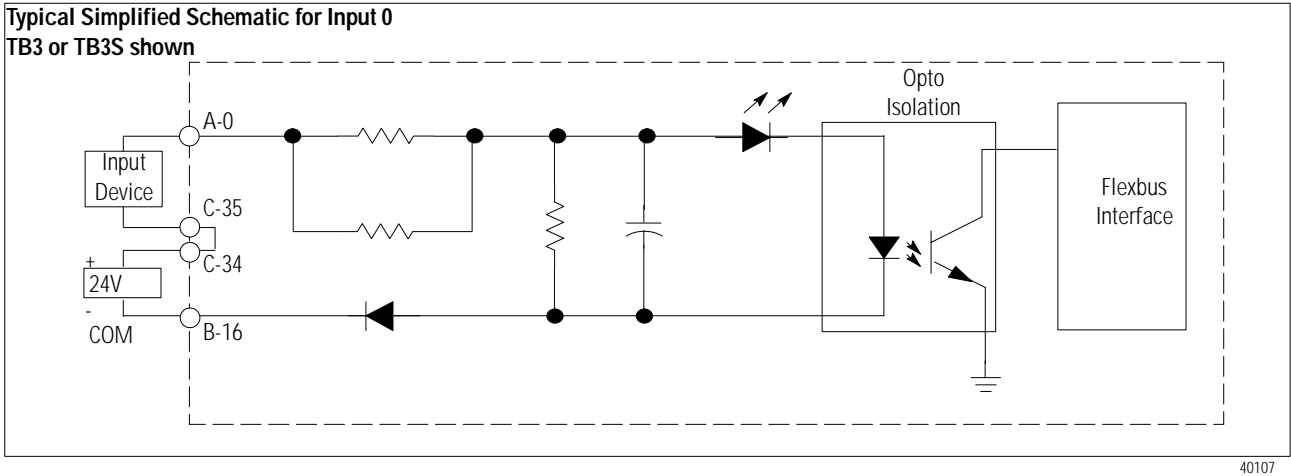
Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-07	
0	0	0	Filter Time 0 (default)	256µs
0	0	1	Filter Time 1	512µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

Specifications - 1793-IB2XOB2P and -IB2XOB2PS	
Number of Channels	2 digital input - sinking 2 digital output - sourcing, protected
Module Location	DIN-rail mounted
Module Type	2 input/2 output digital combination with electronic fusing 1793-IB2XOB2P - screw-clamp terminations 1793-IB2XOB2PS - spring-clamp terminations
Input	
ON-State Voltage	10-31.2V dc; 24V dc nominal
ON-State Current	2-12mA; 8mA @ 24V dc
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Channel Impedance	4.6K Ω
Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - none
Maximum Input Filter Times	256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256µs default - selectable thru output image table (see <i>Setting Input Delay Times</i>)
Output	
On-State Voltage	10-31.2 V dc; 24V dc nominal
On-State Current	1-500mA per channel
Off-State Voltage	31.2V dc maximum
Off-State Current	0.5mA maximum leakage
Channel Impedance	1.0Ω (0.5V dc maximum drop)
Surge Current	1.5A for 50ms, repeatable every 2s
Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - none
Maximum Input Delay Times	OFF to ON ON to OFF 0.5ms maximum 1.0ms maximum
General Specifications	
Flexbus Current	20mA maximum
Power Dissipation	1.4W @ 31.2V dc
Thermal Dissipation	4.8 BTU/hr @ 31.2V dc
Indicators	4 yellow channel status indicators
Fusing	Output are electronically fused
External dc Power	Voltage Current 19.2-31.2V dc (5% ac ripple) 40mA maximum
Dimensions HxWxD	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration 0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) maximum insulation, 90°C minimum temperature rating
Category	2 ¹
Terminal Screw Torque	4-7 inch-pounds
Publication Installation Instructions	1793-5.3
Agency Certification	

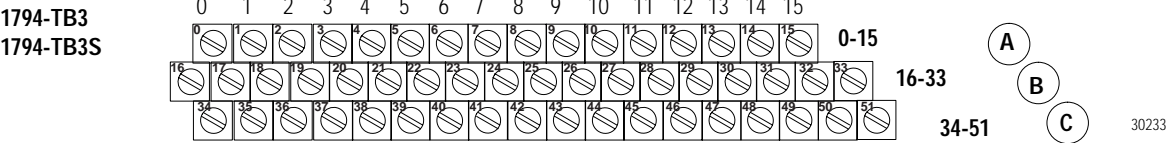
¹ Use this conductor category information for planning conductor routing. Refer to pub 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)

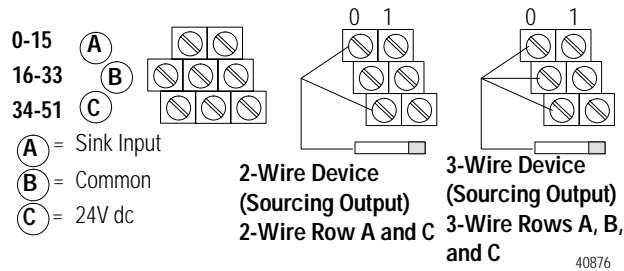


Wiring



Input	1794-TB3 and -TB3S	
	Input Terminal	Voltage Terminal
Input 0	A-0	C-35
Input 1	A-1	C-36
Input 2	A-2	C-37
Input 3	A-3	C-38
Input 4	A-4	C-39
Input 5	A-5	C-40
Input 6	A-6	C-41
Input 7	A-7	C-42
Common	B-16 thru B-33	
+24V dc	C-34 thru C-51	

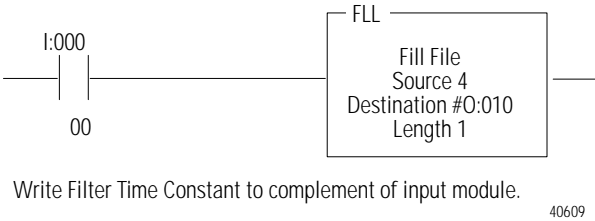
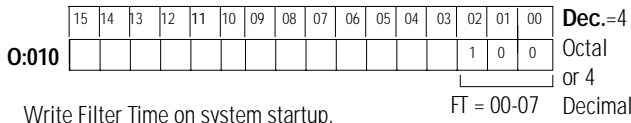
2-Wire and 3-Wire Inputs to the 1794-IB8 Module



Setting Input Filter Times (Standard Mode Addressing Only)

You can select the input filter time (FT) for channels 00 through 07. Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

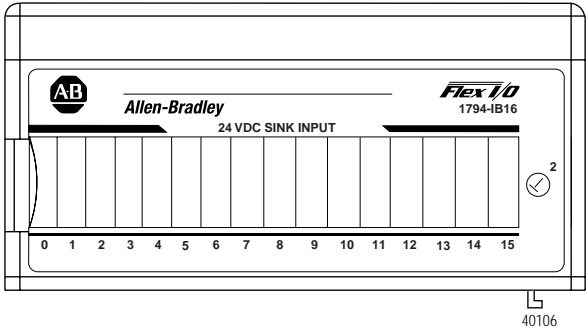
For example, to set a filter time constant of 4ms for a dc input module at address rack 1, module group 0, set bits 02, 01, 00 as shown below.



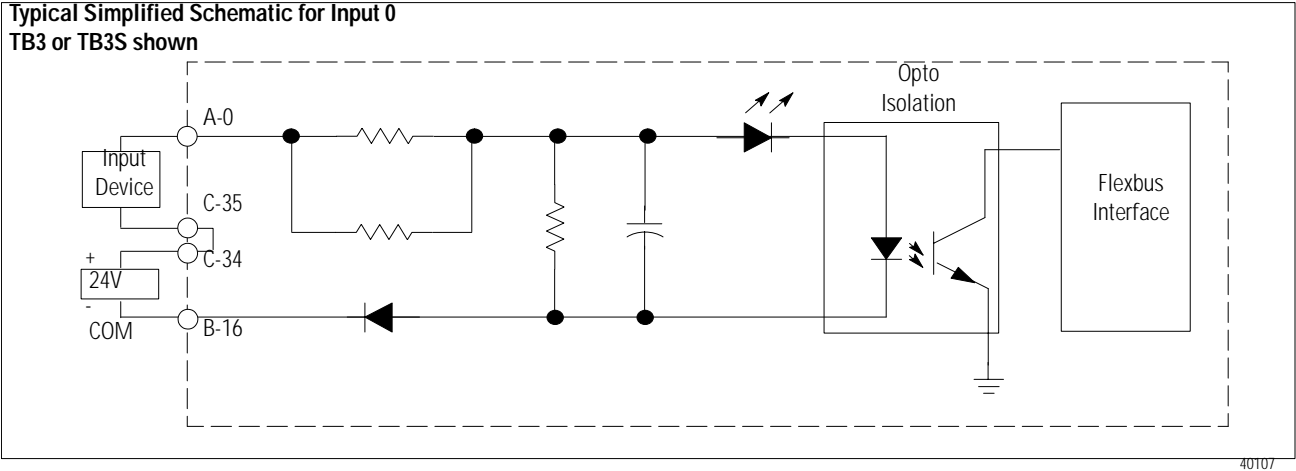
Input Filter Times

Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-07	
0	0	0	Filter Time 0 (default)	256µs
0	0	1	Filter Time 1	512µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

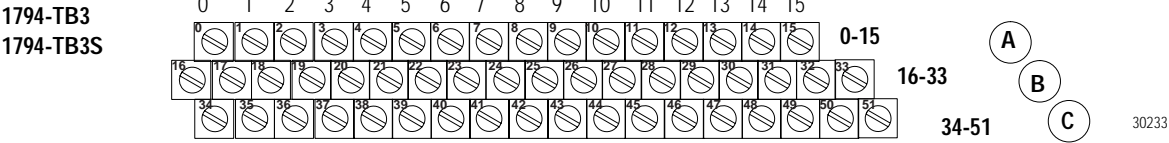
Specifications - 1794-IB8	
Number of Inputs	8 non-isolated, sinking
Module Location	Cat. No. 1794-TB3, -TB3S, or -TBN Terminal Base Unit
ON-State Voltage	10V dc minimum; 24V dc nominal; 31.2V dc maximum
ON-State Current	2.0mA minimum; 8.0mA nominal at 24V dc; 11.0mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	4.6K Ω maximum
Isolation Voltage	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Maximum Input Filter Times	OFF to ON ON to OFF
Flexbus Current (max)	20mA @ 5V dc
Power Dissipation	Maximum 3.5W @ 31.2V dc
Thermal Dissipation	Maximum 11.9 BTU/hr @ 31.2V dc
Indicators (field side indication, customer device driven)	8 yellow status indicators
Keyswitch Position	2
General Specifications	
External dc Power Supply Voltage	24V dc nominal
Voltage Range	19.2 to 31.2V dc (includes 5% ac ripple)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	Operational Temperature Storage Temperature Relative Humidity Shock Vibration
Conductors	Wire Size Category
Publication	Installation Instructions
Agency Certification	
1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."	



Recommended Terminal Base	Compatible Terminal Base(s)

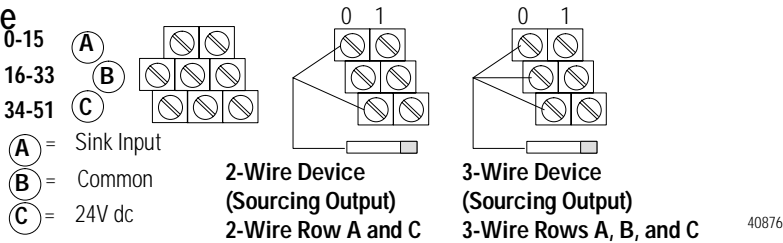


Wiring



1794-TB3 and -TB3S					
Input	Input Terminal	Voltage Terminal	Input	Input Terminal	Voltage Terminal
Input 0	A-0	C-35	Input 8	A-8	C-43
Input 1	A-1	C-36	Input 9	A-9	C-44
Input 2	A-2	C-37	Input 10	A-10	C-45
Input 3	A-3	C-38	Input 11	A-11	C-46
Input 4	A-4	C-39	Input 12	A-12	C-47
Input 5	A-5	C-40	Input 13	A-13	C-48
Input 6	A-6	C-41	Input 14	A-14	C-49
Input 7	A-7	C-42	Input 15	A-15	C-50
Common	B-16 thru B-33		+24v dc	C-34 thru C-51	

2-Wire and 3-Wire Inputs to the 1794-IB16 Module



Setting Input Filter Times

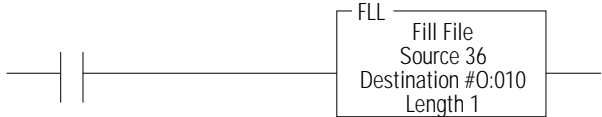
You can select the input filter time for each group of channels (channels 00 through 11, or channels 12 through 15). Select the input filter time by setting the corresponding bits in the **output image table** (complementary word) for the module.

For example, to set a filter time constant of 4ms for a dc input module at address rack 1, module group 0, set bits 05, 04, 03, 02, 01, and 00 as shown below.

Dec.	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
(Octal)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	=44 Octal
O:010											1	0	0	1	0	0	Decimal

$$FT = 12-15 \quad FT = 00-11$$

Write Filter Time on system startup.



Write Filter Time Constant to complement of input module.

40154

Input Filter Times (Standard Addressing Mode Only)

Bits			Description	Maximum Filter Time
02	01	00	Filter Times 00-11 (00-13)	256µs 512µs 1ms 2ms 4ms 8ms 16ms 32ms
05	04	03	Filter Times 12-15 (14-17)	
0	0	0	Filter Time 0 (default)	
0	0	1	Filter Time 1	
0	1	0	Filter Time 2	
0	1	1	Filter Time 3	
1	0	0	Filter Time 4	
1	0	1	Filter Time 5	
1	1	0	Filter Time 6	
1	1	1	Filter Time 7	

Specifications - 1794-IB16

Number of Inputs	16 (1 group of 16), non-isolated, sinking
Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base
ON-State Voltage	10V dc minimum; 24V dc nominal; 31.2V dc maximum
Mounting	Refer to derating curve
ON-State Current	2.0mA minimum; 8.0mA nominal at 24V dc; 12.0mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	4.6K Ω maximum
Isolation Voltage	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Max Input Filter Times Off to ON	256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, and 32ms
ON to OFF	256µs, 512µs, 1ms, 2ms, 4ms, 8ms, 16ms, and 32ms 256µs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current (max)	30mA @ 5V dc
Power Dissipation	Maximum 6.1W @ 31.2V dc
Thermal Dissipation	Maximum 20.8 BTU/hr @ 31.2V dc

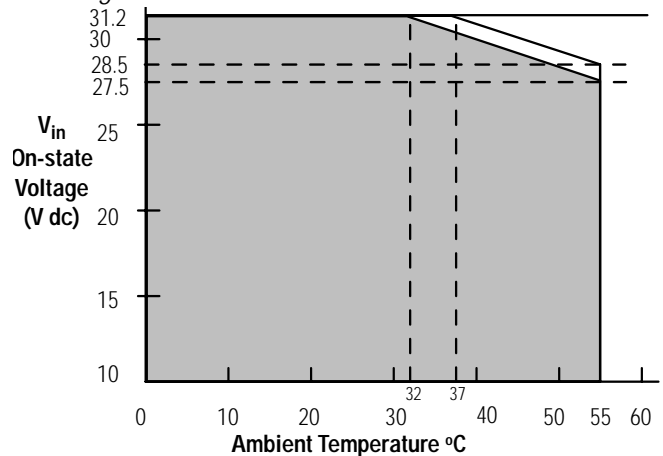
Indicators (field side indication, customer device driven)	16 yellow status indicators
Keyswitch Position	2

General Specifications

External dc Power Supply Voltage Voltage Range	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) Refer to derating curve
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.4
Agency Certification	Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

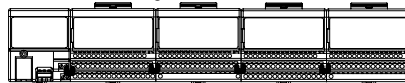


The area within the curve represents the safe operating range for the module under v conditions of user supplied 24V dc supply voltages and ambient temperatures.

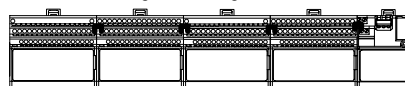
= Normal mounting safe operating range, included
 = Other mounting positions (including inverted horizontal) safe operating range)

40220

Normal Mounting - Horizontal

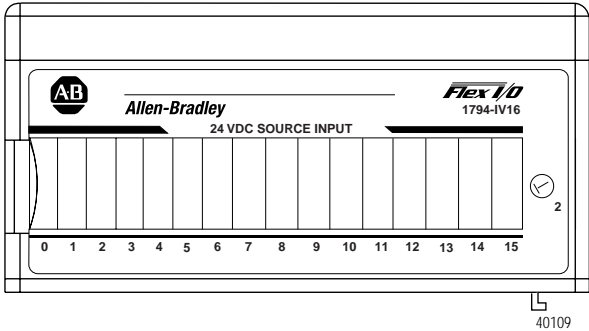


Other Mounting (including Vertical and Inverted Horizontal Mounting)

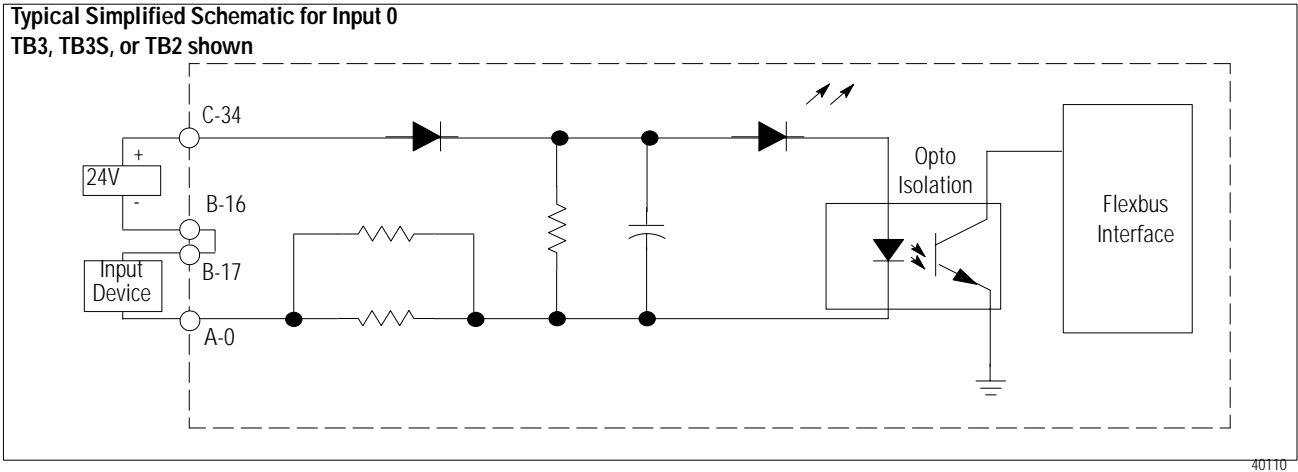


40221

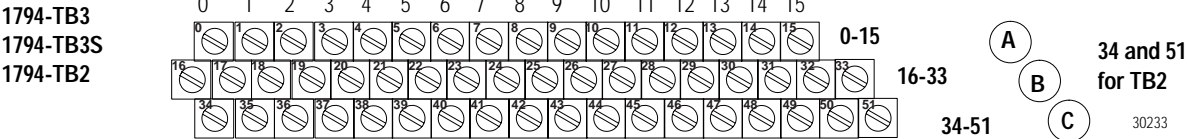
Voltage (max)	Temperature (max)		Voltage (max)	Temperature (max)	
	Normal	Other		Normal	Other
31.2	37	32	29.0	51	45
30.5	41	36	28.5		48
30.0	45	39	28.0	55	51
29.5	48	42	27.5		55



Recommended Terminal Base	Compatible Terminal Base(s)

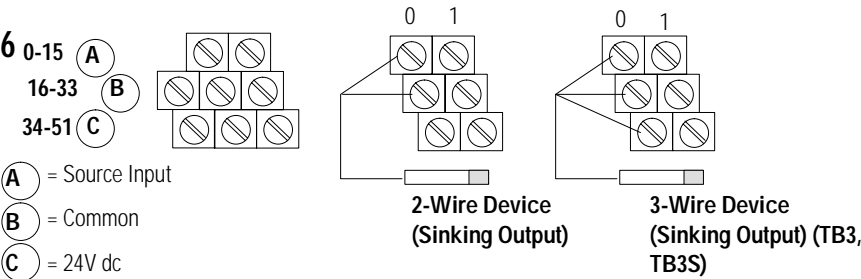


Wiring



1794-TB3, -TB3S, and -TB2					
Input	Input Terminal	Common Terminal	Input	Input Terminal	Common Terminal
Input 0	A-0	B-17	Input 8	A-8	B-25
Input 1	A-1	B-18	Input 9	A-9	B-26
Input 2	A-2	B-19	Input 10	A-10	B-27
Input 3	A-3	B-20	Input 11	A-11	B-28
Input 4	A-4	B-21	Input 12	A-12	B-29
Input 5	A-5	B-22	Input 13	A-13	B-30
Input 6	A-6	B-23	Input 14	A-14	B-31
Input 7	A-7	B-24	Input 15	A-15	B-32
Common	B-16 thru B-33		24v dc	C-34 thru C-51 (C-34 and C-51 for TB2)	

2-wire and 3-wire
Inputs to the 1794-IV16
FLEX I/O Module



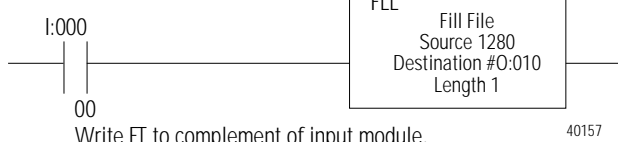
Setting the Input Filter Time

You can select the input filter time (FT) for all channels (channels 00 through 15). Select the input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module. For example, to set a filter time of 8ms for a dc input module at address rack 1, module group 0, set bits 10, 09 and 08 as shown below.

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec.
0:010						1	0	1									=2400 Octal or 1280 Decimal

FT for channels 00 thru 15

Write Filter Time on system startup.



Write FT to complement of input module.

Input Filter Times (Standard Addressing Mode Only)

Bits			Description	Selected Filter Time
10	09	08	Filter Time for Inputs 00-15(00-17)	
0	0	0	Filter Time 0 (default)	256μs
0	0	1	Filter Time 1	512μs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

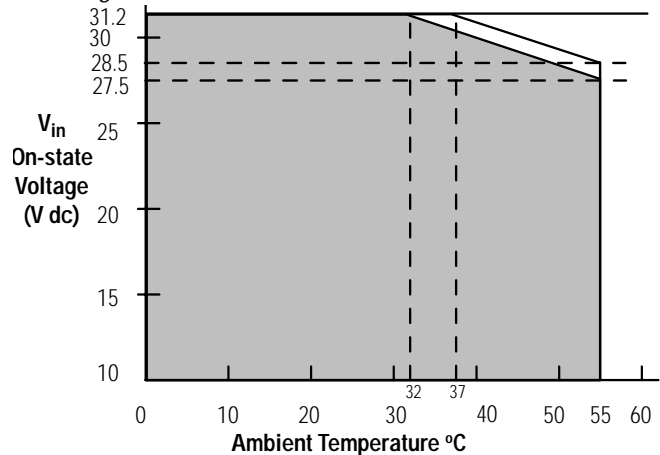
Specifications - 1794-IV16

Number of Inputs	16 (1 group of 16), non-isolated, sourcing
Module Location	Cat. No. 1794-TB2, -TB3, or -TB3S Terminal Base Unit
ON-State Voltage	10V dc minimum; 24V dc nominal; 31.2V dc maximum
ON-State Current	2.0mA minimum; 8.0mA nominal at 24V dc; 11.0mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	4.7K Ω maximum
Isolation Voltage	100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Input Filter Times OFF to ON	256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, and 32ms
ON to OFF	256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, and 32ms 256μs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current (max)	30mA
Power Dissipation	Maximum 5.7W @ 31.2V dc
Thermal Dissipation	Maximum 19.4 BTU/hr @ 31.2V dc
Indicators (field side indication, customer device driven)	16 yellow status indicators

Keyswitch Position	2
General Specifications	
External dc Power Supply Voltage Voltage Range	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.28
Agency Certification	Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

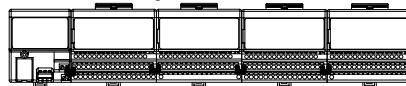


The area within the curve represents the safe operating range for the module under various conditions of user supplied 24V dc supply voltages and ambient temperatures.

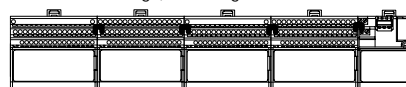
= Normal mounting safe operating range, included
 = Other mounting positions (including inverted horizontal) safe operating range)

40220

Normal Mounting - Horizontal

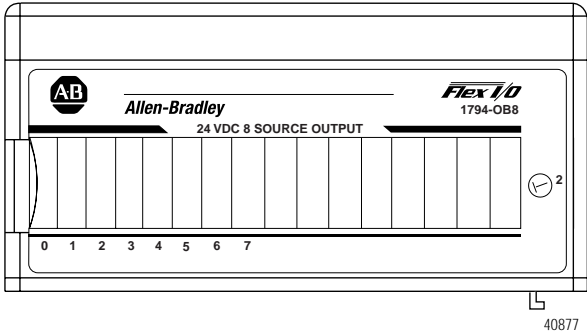


Other Mounting (including Vertical and Inverted Horizontal Mounting)

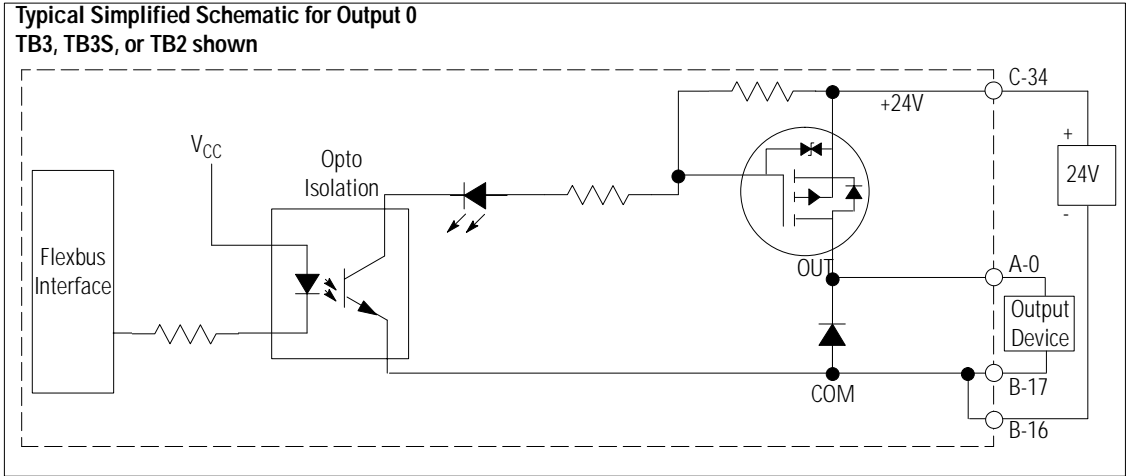


40221

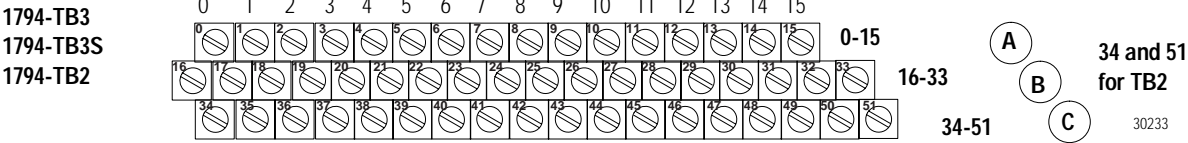
Voltage (max)	Temperature (max)		Voltage (max)	Temperature (max)	
	Normal	Other		Normal	Other
31.2	37	32	29.0	51	45
30.5	41	36	28.5		48
30.0	45	39	28.0	55	51
29.5	48	42	27.5		55



Recommended Terminal Base	Compatible Terminal Base(s)	






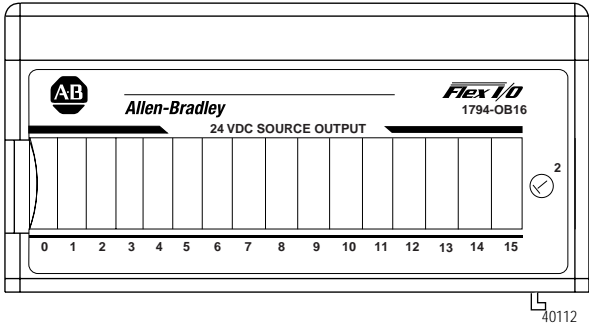
Wiring






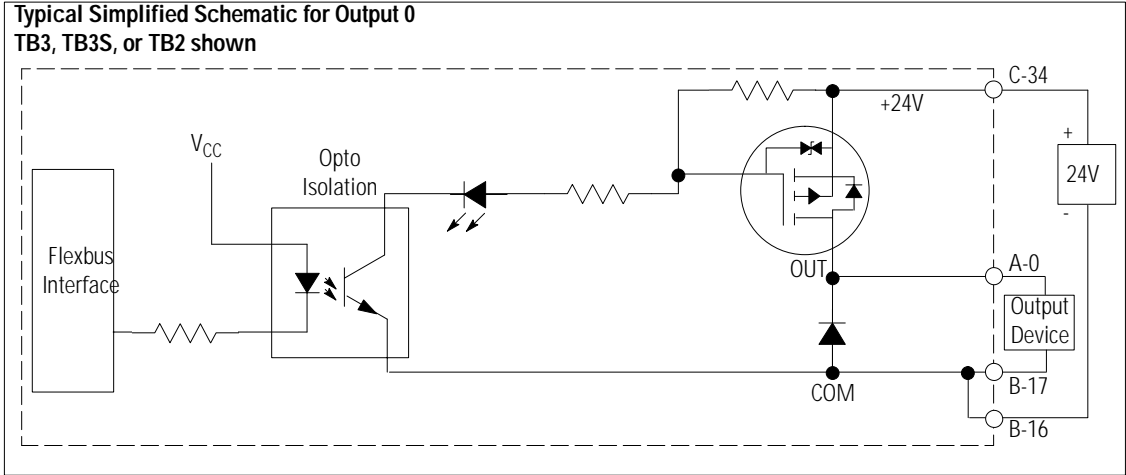
Output	1794-TB3, -TB3S, and -TB2	
	Output Terminal	Common Terminal1
Output 0	A-0	B-17
Output 1	A-1	B-18
Output 2	A-2	B-19
Output 3	A-3	B-20
Output 4	A-4	B-21
Output 5	A-5	B-22
Output 6	A-6	B-23
Output 7	A-7	B-24
+24V dc	C-34 thru C-51 (C-34 and C-51 for TB2)	
Common	B-16 thru B-33	

Specifications - 1794-OB8	
Number of Outputs	8 (1 group of 8) non-isolated, sourcing
Module Location	Cat. No. 1794-TB2, -TB3, or -TB3S Terminal Base Unit
ON-State Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.5V dc maximum
ON-State Current	1.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Output Signal Delay OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current (max)	60mA
Power Dissipation	3.3W maximum @ 31.2V
Thermal Dissipation	11.2 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	8 yellow status indicators
Output Current Rating	4A (8 outputs @ 0.5A)
Surge Current	2A for 50ms, repeatable every 2s
Fusing	Module outputs are not fused. Fusing of outputs is recommended. If fusing is desired, you must provide external fusing, use SAN-O MQ4-800mA fuses.
Keyswitch Position	2

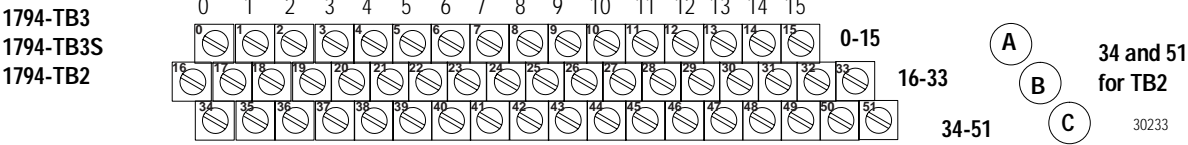
General Specifications	
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 25mA @ 24V dc (20 to 35mA)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.31
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 
¹ You use this conductor category information for planning conductor routing as described in the system level installation manual.	



Recommended Terminal Base	Compatible Terminal Base(s)	
		






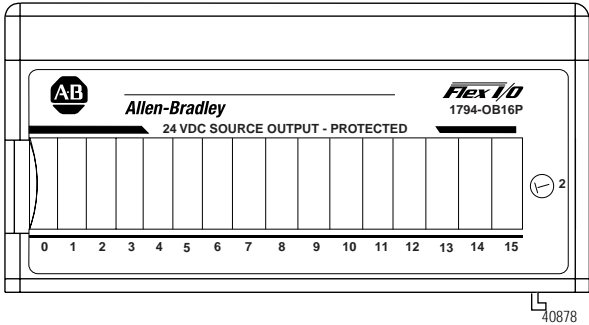
Wiring






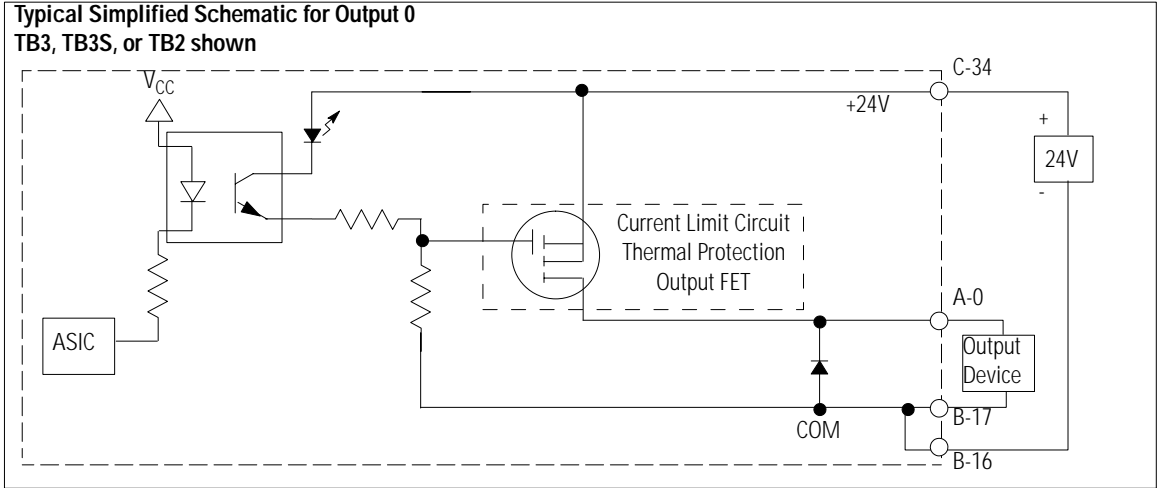
1794-TB3, -TB3S, and -TB2					
Output	Output Terminal	Common Terminal	Output	Output Terminal	Common Terminal
Output 0	A-0	B-17	Output 8	A-8	B-25
Output 1	A-1	B-18	Output 9	A-9	B-26
Output 2	A-2	B-19	Output 10	A-10	B-27
Output 3	A-3	B-20	Output 11	A-11	B-28
Output 4	A-4	B-21	Output 12	A-12	B-29
Output 5	A-5	B-22	Output 13	A-13	B-30
Output 6	A-6	B-23	Output 14	A-14	B-31
Output 7	A-7	B-24	Output 15	A-15	B-32
Common	B-16 thru B-33		+24v dc	C-34 thru C-51 (C-34 and C-51 for TB2)	

Specifications - 1794-OB16	
Number of Outputs	16 (1 group of 16), non-isolated, sourcing
Module Location	Cat. No. 1794-TB2, -TB3, or -TB3S Terminal Base Unit
ON-State Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.5V dc maximum
ON-State Current	1.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Output Signal Delay OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current (max)	80mA
Power Dissipation	5.3W maximum @ 31.2V
Thermal Dissipation	18.1 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	16 yellow status indicators
Output Current Rating	8A (16 outputs @ 0.5A) horizontal or vertical
Surge Current	2A for 50ms, repeatable every 2 seconds
Keyswitch Position	2
Fusing ¹	SAN-O MQ4-800mA

General Specifications	
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 49mA @ 24V dc (38mA to 65mA)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ²
Publication Installation Instructions	1794-5.3
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 
¹ Module outputs are not fused. Fusing of outputs is recommended. If external fusing is desired, you must provide external fusing. ² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."	

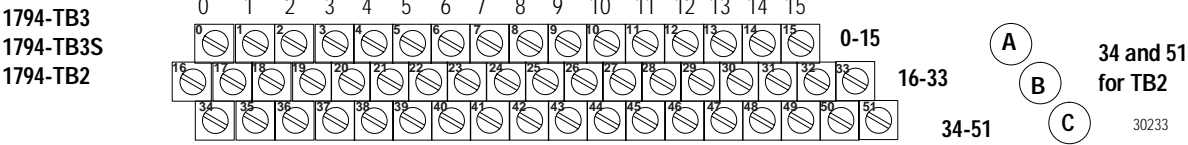


Recommended Terminal Base	Compatible Terminal Base(s)	
		



41017

Wiring






1794-TB3, -TB3S, and -TB2					
Output	Output Terminal	Common Terminal	Output	Output Terminal	Common Terminal
Output 0	A-0	B-17	Output 8	A-8	B-25
Output 1	A-1	B-18	Output 9	A-9	B-26
Output 2	A-2	B-19	Output 10	A-10	B-27
Output 3	A-3	B-20	Output 11	A-11	B-28
Output 4	A-4	B-21	Output 12	A-12	B-29
Output 5	A-5	B-22	Output 13	A-13	B-30
Output 6	A-6	B-23	Output 14	A-14	B-31
Output 7	A-7	B-24	Output 15	A-15	B-32
Common	B-16 thru B-33		+24v dc	C-34 thru C-51 (C-34 and C-51 for TB2)	

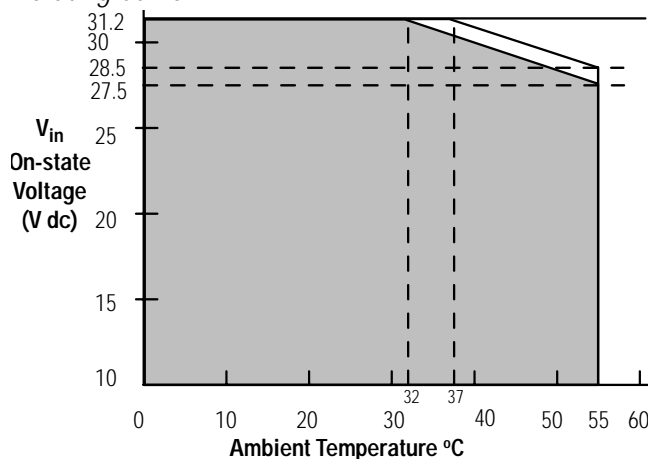
Specifications - 1794-OB16P

Number of Outputs	16 (1 group of 16), non-isolated, sourcing
Module Location	Cat. No. 1794-TB2, -TB3, or -TB3S Terminal Base Unit
ON-State Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.5V dc maximum
ON-State Current	1.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Output Signal Delay OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current (max)	60mA
Power Dissipation	5.0W maximum @ 31.2V
Thermal Dissipation	17.0 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	16 yellow status indicators
Output Current Rating	8A (16 outputs @ 0.5A)
Surge Current	1.5A for 50ms, repeatable every 2s
Keyswitch Position	2
Fusing	Outputs are electronically protected




General Specifications

External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 10 to 31.2V dc (includes 5% ac ripple) 60mA @ 24V dc (25mA to 75mA) (Refer to the Derating Curve below)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.45
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

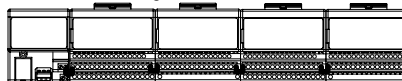
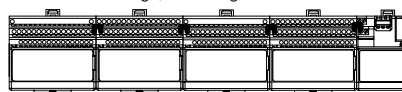
¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

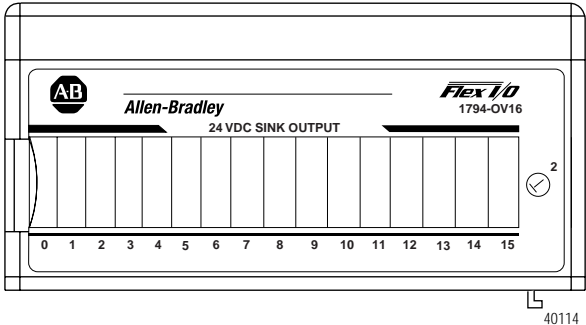
The area within the curve represents the safe operating range for the module under v_i conditions of user supplied 24V dc supply voltages and ambient temperatures.



 = Normal mounting safe operating range,  included
 = Other mounting positions (including inverted horizontal) safe operating range)

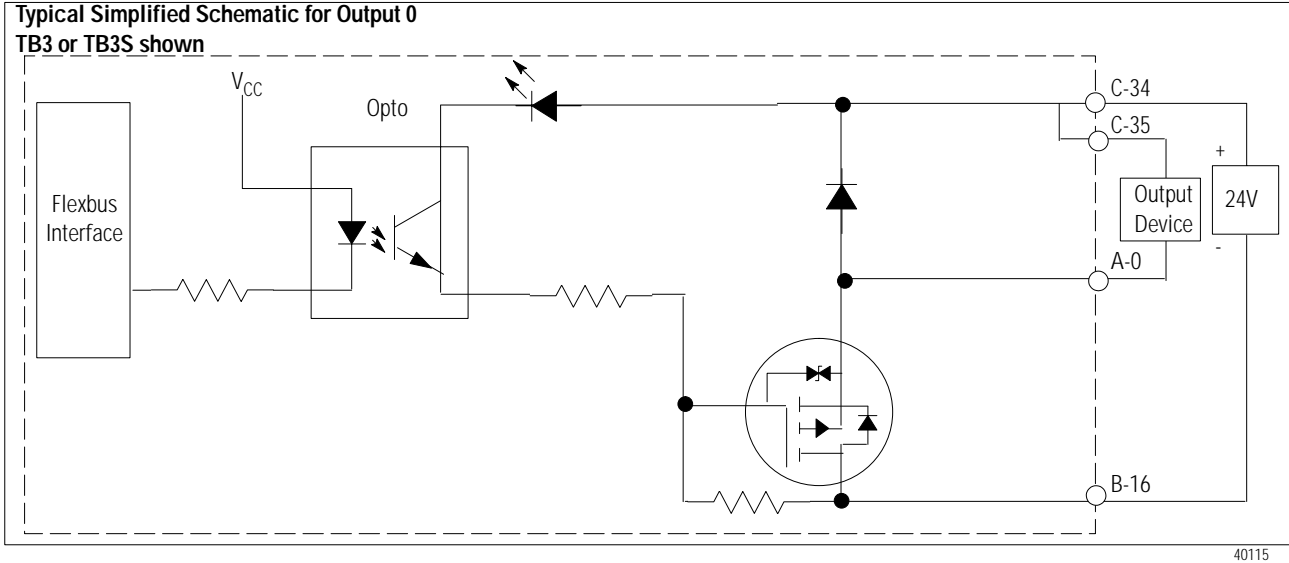
40220

Normal Mounting - Horizontal**Other Mounting (including Vertical and Inverted Horizontal Mounting)**

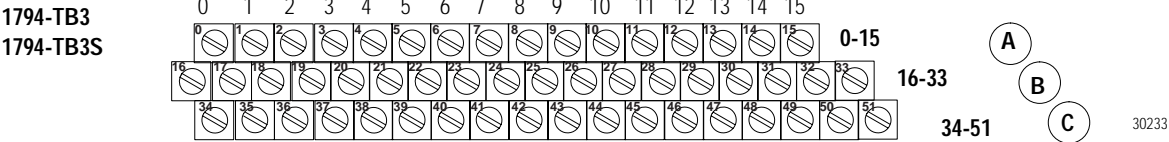
40221



Recommended Terminal Base	Compatible Terminal Base(s)
	






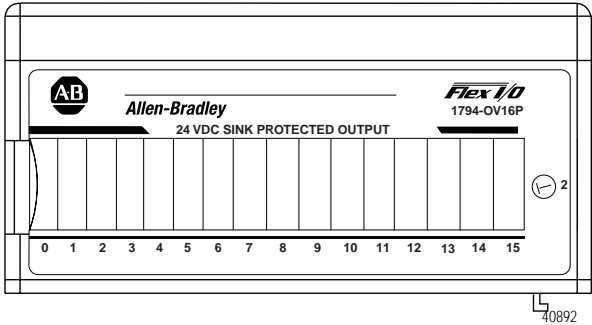
Wiring



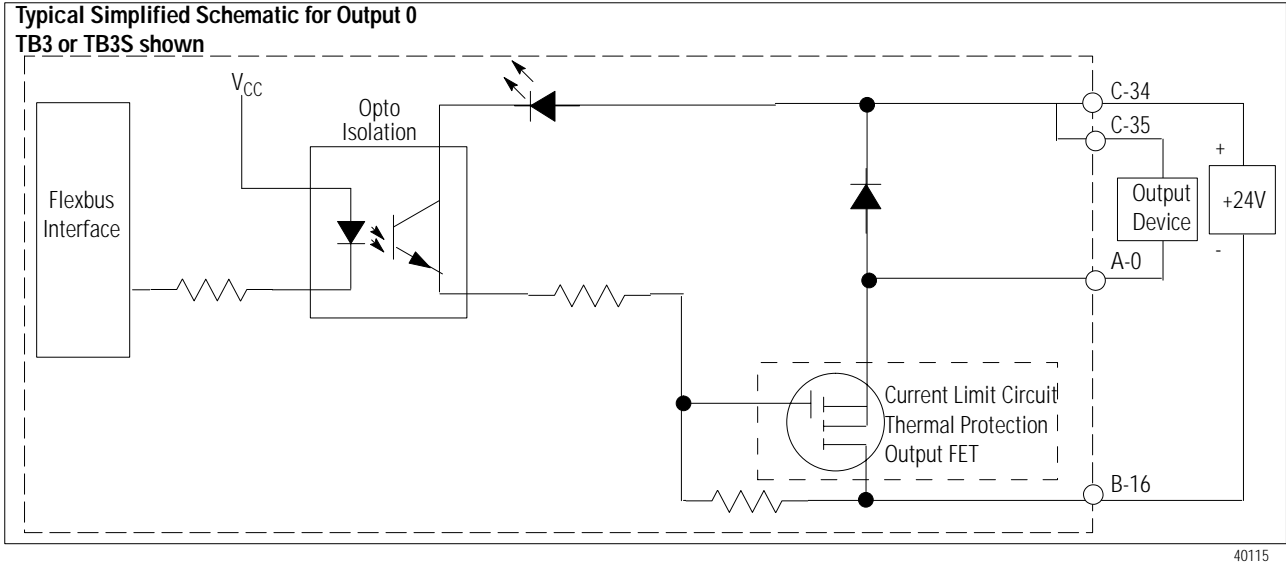
1794-TB3 and -TB3S					
Output	Output Terminal	Power Terminal	Output	Output Terminal	Power Terminal
Output 0	A-0	C-35	Output 8	A-8	C-43
Output 1	A-1	C-36	Output 9	A-9	C-44
Output 2	A-2	C-37	Output 10	A-10	C-45
Output 3	A-3	C-38	Output 11	A-11	C-46
Output 4	A-4	C-39	Output 12	A-12	C-47
Output 5	A-5	C-40	Output 13	A-13	C-48
Output 6	A-6	C-41	Output 14	A-14	C-49
Output 7	A-7	C-42	Output 15	A-15	C-50
Common	B-16 thru B-33		+24v dc	C-34 thru C-51	

Specifications - 1794-OV16	
Number of Outputs	16 (1 group of 16), non-isolated, sinking
Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base Unit
ON-State Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.2V dc maximum
ON-State Current	1.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Output Signal Delay OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current (max)	80mA
Power Dissipation	4.2W maximum @ 31.2V
Thermal Dissipation	14.3 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	16 yellow status indicators
Output Current Rating	8A (16 outputs @ 0.5A)
Surge Current	2A for 50ms, repeatable every 2 seconds
Keyswitch Position	2
Fusing ¹	SAN-O MQ4-800 800mA fuses

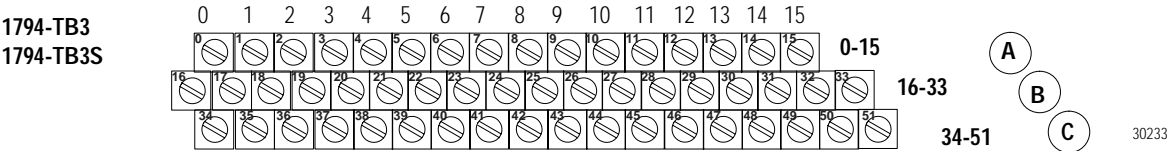
General Specifications	
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 49mA @ 24V dc (38mA to 65mA)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ²
Publication Installation Instructions	1794-5.29
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 
¹ Module outputs are not fused. Fusing of outputs is recommended. If external fusing is desired, you must provide external fusing. ² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."	



Recommended Terminal Base	Compatible Terminal Base(s)






Wiring

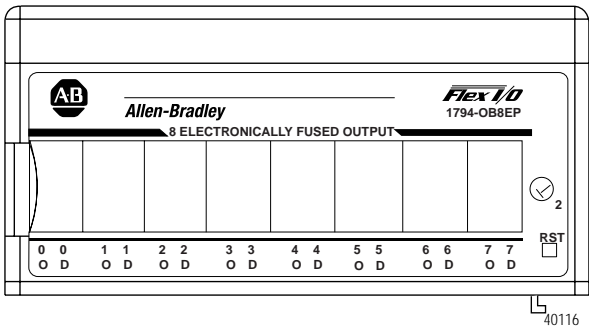


1794-TB3 and -TB3S					
Output	Output Terminal	Common Terminal	Output	Output Terminal	Common Terminal
Output 0	A-0	C-35	Output 8	A-8	C-43
Output 1	A-1	C-36	Output 9	A-9	C-44
Output 2	A-2	C-37	Output 10	A-10	C-45
Output 3	A-3	C-38	Output 11	A-11	C-46
Output 4	A-4	C-39	Output 12	A-12	C-47
Output 5	A-5	C-40	Output 13	A-13	C-48
Output 6	A-6	C-41	Output 14	A-14	C-49
Output 7	A-7	C-42	Output 15	A-15	C-50
Common	B-16 thru B-33		+24v dc	C-34 thru C-51	

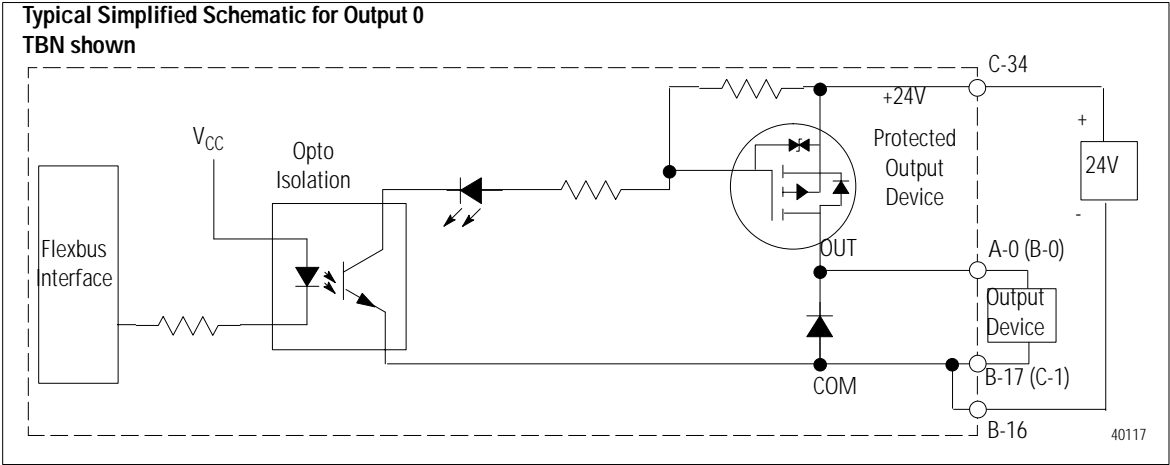
Specifications - 1794-OV16P	
Number of Outputs	16 (1 group of 16), non-isolated, sinking
Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base Unit
ON-State Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.2V dc maximum
ON-State Current	1.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Output Signal Delay OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Flexbus Current (max)	80mA
Power Dissipation	4.2W maximum @ 31.2V
Thermal Dissipation	14.3 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	16 yellow status indicators
Output Current Rating	8A (16 outputs @ 0.5A)
Surge Current	2A for 50ms, repeatable every 2s
Keyswitch Position	2
Fusing	Outputs are electronically protected

General Specifications	
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 49mA @ 24V dc (38mA to 65mA)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.52
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

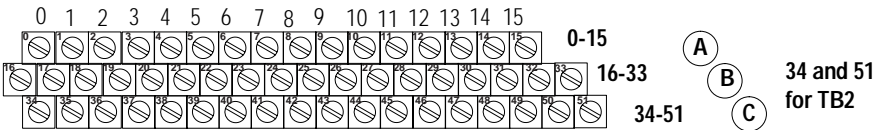


Recommended Terminal Base	Compatible Terminal Base(s)			

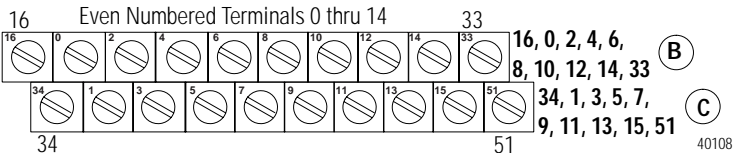


Wiring

1794-TB3
1794-TB3S
1794-TB2



1794-TBN



1794-TB3, -TB3S, and -TB2			1794-TBN	
Output	Output Terminal	Common Terminal ¹	Output Terminal	Common Terminal ²
Output 0	A-0	A-1 ¹ /B-17	B-0	C-1 ²
Output 1	A-2	A-3 ¹ /B-19	B-2	C-3 ²
Output 2	A-4	A-5 ¹ /B-21	B-4	C-5 ²
Output 3	A-6	A-7 ¹ /B-23	B-6	C-7 ²
Output 4	A-8	A-9 ¹ /B-25	B-8	C-9 ²
Output 5	A-10	A-11 ¹ /B-27	B-10	C-11 ²
Output 6	A-12	A-13 ¹ /B-29	B-12	C-13 ²
Output 7	A-14	A-15 ¹ /B-31	B-14	C-15 ²

A = output terminals
B = common terminals
C = power terminals (C-34 thru 51 for 1794-TB3, -TB3S; 34 and 51 for 1794-TB2)




B = even numbered output terminals 0 thru 14, dc common terminals 16 and 33
C = power terminals C-34 and C-51, and odd numbered output common terminals 1 thru 15

1 A-1, 3, 5, 7, 9, 11, 13, and 15 are connected together inside the module to 24V dc common.
2 C-1, 3, 5, 7, 9, 11, 13, and 15 are connected together inside the module to 24V dc common.

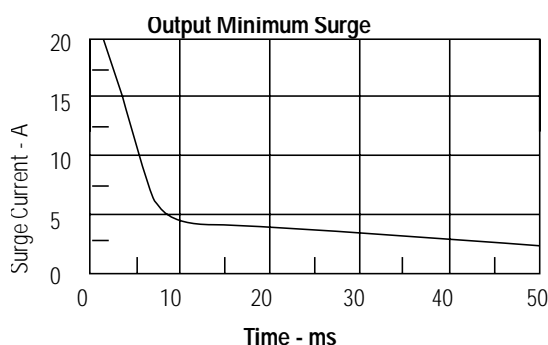
Specifications - 1794-OB8EP

Number of Outputs	8 (1 group of 8), non-isolated, sourcing
Module Location	Cat. No. 1794-TB3, -TB3S, -TBN, or -TB2 Terminal Base Unit
ON-State Voltage Range	19.2V dc minimum 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	0.2V dc maximum
ON-State Current	1.0mA minimum per channel 2.0A maximum per channel
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Isolation Voltage (min)	100% tested at 850V dc for 1s between user and system No isolation between individual channels
Output Signal Delay ¹ OFF to ON ON to OFF	0.1ms maximum 0.1ms maximum
Flexbus Current (max)	73mA
Power Dissipation	5.5W maximum @ 31.2V
Thermal Dissipation	18.8 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	8 yellow status indicators; 8 red fault indicators
Output Current Rating	Maximum 2.0A per output 10A maximum per module (e.g. 8 outputs @ 1.25A, 5 outputs @ 2.0A, or similar output/ampere combinations totaling 10A or less)
Surge Current	4A for 10ms, repeatable every 3 seconds (see chart)
Keyswitch Position	2
Fusing	Outputs are electronically protected.

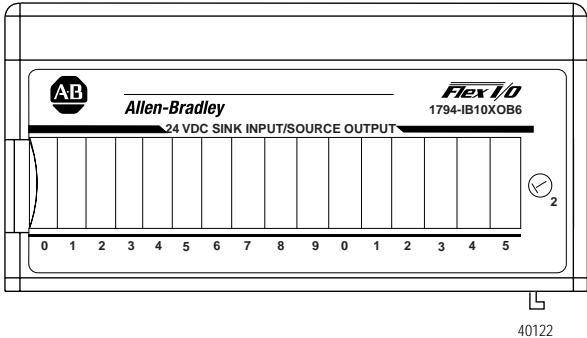
General Specifications



External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 80mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ²
Publication Installation Instructions	1794-5.20
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

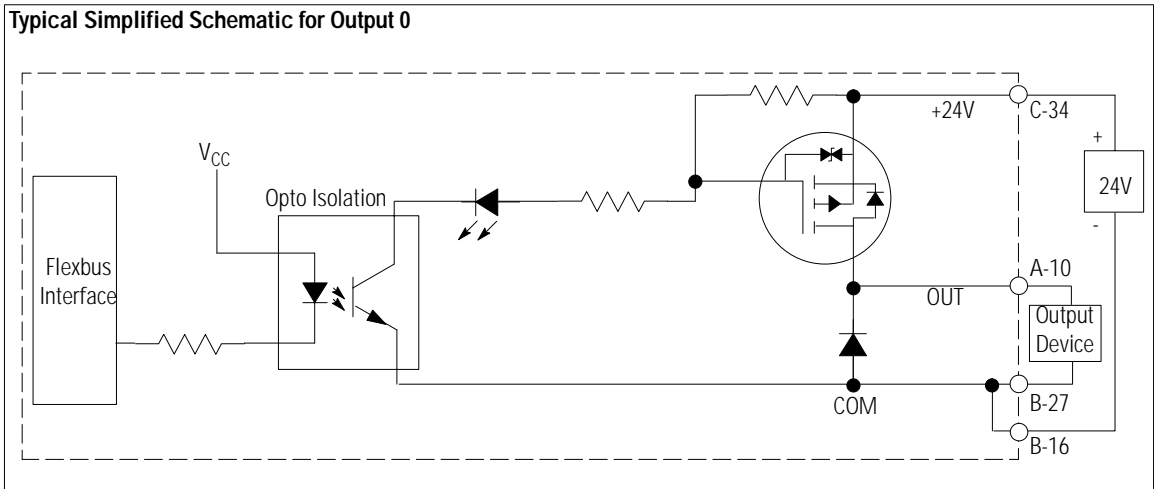
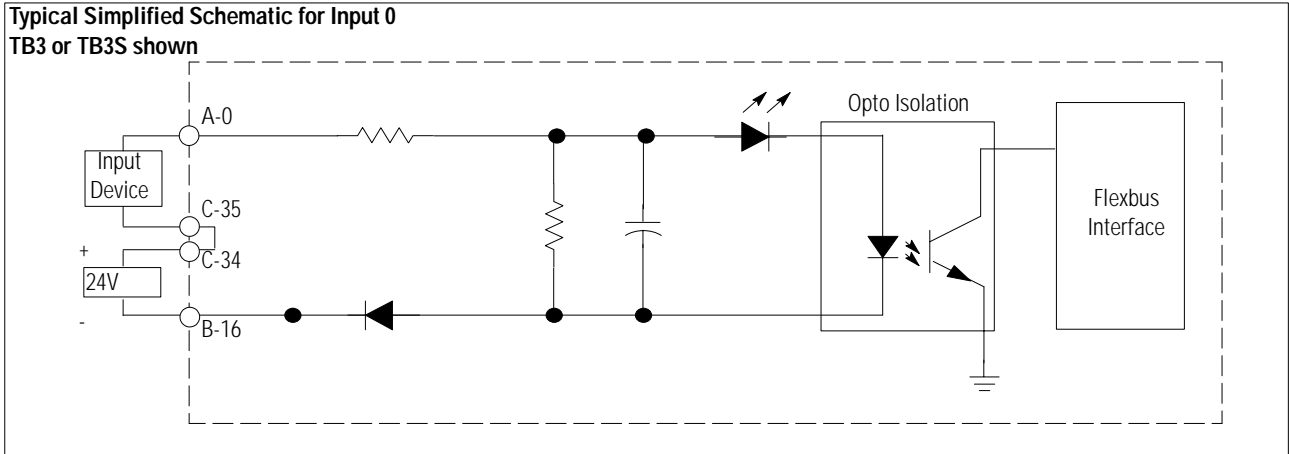
- 1 Off/on delay is time from a valid output "on" signal to output energization. On/off delay is time from a valid output "off" signal to output deenergization.
- 2 You use this conductor category information for planning conductor routing as described in the system level installation manual.



30232



Recommended Terminal Base	Compatible Terminal Base(s)
	



Wiring to a 1794-TB3 or -TB3S Terminal Base Unit

1. Connect the associated input or output power to the corresponding terminal on the **34-51** row (**C**) for each as indicated in the table below. (Power terminals 34 thru 51 are internally connected together.)
2. Connect the +24V dc power to terminal 34 on the **34-51** row (**C**).
3. If continuing power to the next terminal base unit, connect a jumper from terminal 51 (+24V dc) on this base unit to terminal 34 on the next base unit.
4. Connect the associated input or output return to the corresponding terminal on the **16-33** row (**B**) for each as indicated in the table below. (Returns are internally connected together.)
5. Connect 24V dc return to terminal 16 on the **16-33** row (**B**).
6. If continuing 24V return to the next terminal base unit, connect a jumper from terminal 33 (return) on this base unit to terminal 16 on the next base unit.
7. Connect the individual input and output wiring to numbered terminals on the **00-15** row (**A**) as indicated in the table below.

ATTENTION

Total current draw through the terminal base unit is limited to 10A. Separate power connections may be necessary.



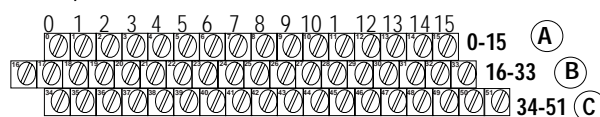
Channel	Signal Type ¹	1794-TB3 and -TB3S		
		Signal	Return ²	Supply ³
Input				
0	Sink Input	A-0	B-17	C-35
1	Sink Input	A-1	B-18	C-36
2	Sink Input	A-2	B-19	C-37
3	Sink Input	A-3	B-20	C-38
4	Sink Input	A-4	B-21	C-39
5	Sink Input	A-5	B-22	C-40
6	Sink Input	A-6	B-23	C-41
7	Sink Input	A-7	B-24	C-42
8	Sink Input	A-8	B-25	C-43
9	Sink Input	A-9	B-26	C-44
Output				
0	Source Output	A-10	B-27	
1	Source Output	A-11	B-28	
2	Source Output	A-12	B-29	
3	Source Output	A-13	B-30	
4	Source Output	A-14	B-31	
5	Source Output	A-15	B-32	
	24V dc Return	16 thru 33		
	+24V dc power	34 thru 51		

¹ 2-wire devices use signal and supply terminals, 3-wire input devices use signal, return, and supply terminals.

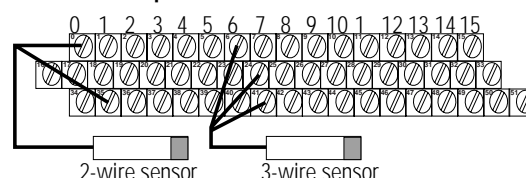
² +24V return internally connected to terminals 16 thru 33.

³ +24V dc power internally connected to terminals 34 thru 51.

1794-TB3, -TB3S



Example of 2-wire and 3-wire sensor



40161

Setting Input Filter Time (Standard Addressing Mode Only)

(not available when used with the 1794-ASB adapter)

You can select the input filter time (FT) for the input channels (channels 00 through 09). Select the input filter time by setting the corresponding bits in the configuration word (word 3) for the module.

For example, to set a filter time of 8ms for a dc input module at address rack 1, module group 0, set bits 08, 09, and 10 in configuration word 3 as shown below.

Bits			Description	Filter Time
10	09	08	Filter Time for Inputs 00-09	Off to On/ On to Off
0	0	0	Filter Time 0 (default)	0.25ms
0	0	1	Filter Time 1	0.5ms
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

Specifications - 1794-IB10XOB6

Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base Unit
Isolation Voltage (min)	1250V ac (rms) isolation 100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Flexbus Current (max)	35mA @ 5V dc
Power Dissipation	6.0W maximum @ 31.2V
Thermal Dissipation	20.3 BTU/hr @ 31.2V dc
Keyswitch Position	2
Fusing ¹	SAN-O MQ4-3A Littelfuse 235 003




Input Specifications

Number of Inputs	10 (1 group of 10), non-isolated, sinking
ON-State Voltage	10V dc minimum; 24V dc nominal; 31.2V dc maximum
ON-State Current	2.0mA minimum; 8.0mA nominal at 24V dc; 11.0mA maximum
OFF-State Voltage	5.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	4.8K Ω maximum
Input Filter Time ² OFF to ON ON to OFF	0.25ms, 0.5ms, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 0.25ms, 0.5ms, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 0.25ms default - Selectable using configuration word 3. (Not selectable when used with the 1794-ASB adapter.)
Indicators (field side indication, customer device driven)	10 yellow status indicators

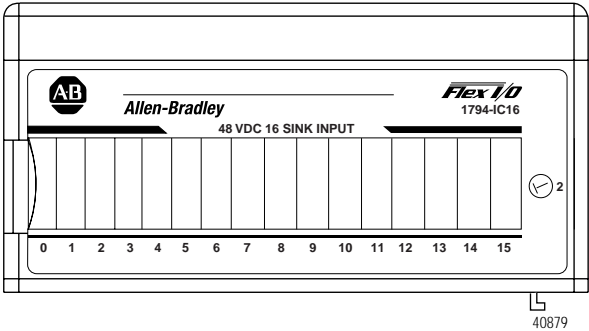
Output Specifications



Number of Outputs	6 (1 group of 6), non-isolated, sourcing
ON-State Voltage Range	10V dc minimum; 24V dc nominal; 31.2V dc maximum
ON-State Voltage Drop	1V dc @ 2A, 0.5V dc @ 1A maximum
ON-State Current	1.0mA minimum per channel; 2.0A maximum per channel; 10A maximum per module
OFF-State Voltage	31.2V dc maximum
OFF-State Leakage	0.5mA maximum
Output Current Rating	2A per output, 10A per module maximum
Output Signal Delay ³ OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum
Surge Current	4A for 50ms, repeatable every 2s
Indicators (field side indication, logic driven)	6 yellow status indicators

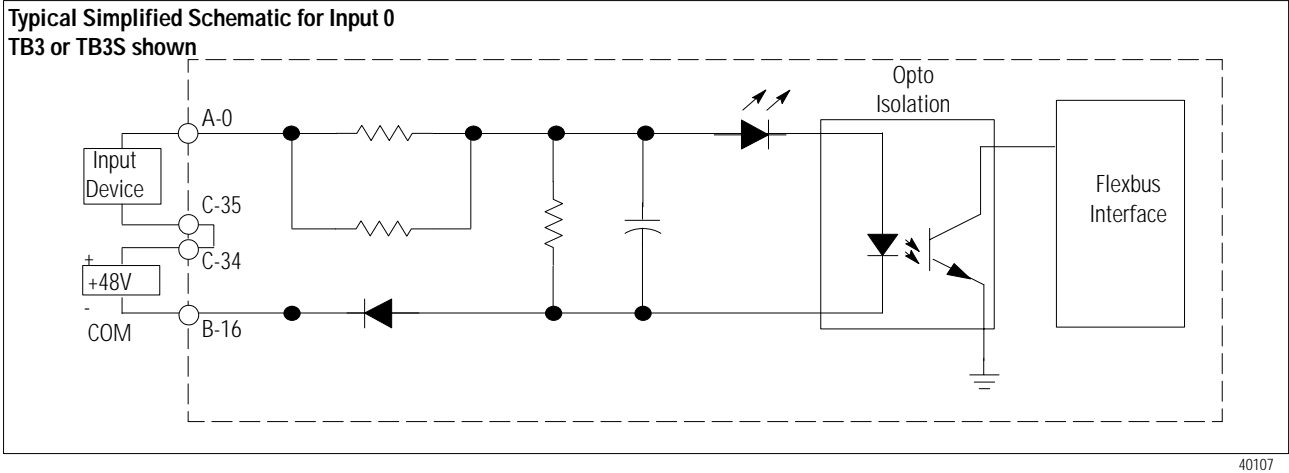
General Specifications

External dc Power Supply Voltage Voltage Range Output Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 15mA @ 19.2V dc; 19mA @ 24V dc 24mA @ 30V dc; 25mA @ 31.2V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ⁴
Publication Installation Instructions	1794-5.24
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified  Class I Zone 2 Group IIC certified

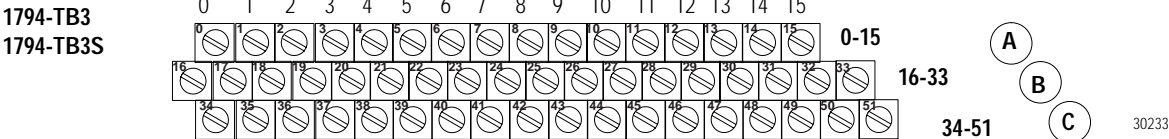
- 1 Module outputs are not fused but fusing of outputs is recommended. If external fusing is required, you must provide external fusing.
- 2 Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off is filter time from the input signal dropping below the valid level to recognition by the module.
- 3 Output off-to-on or on-to-off delay is the time from the module issuing an output on or off until the output actually turns on or off.
- 4 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)
	

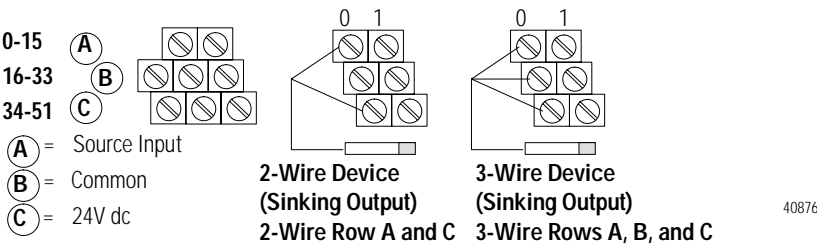


Wiring



Input	Input Terminal	Voltage Terminal	Input	Input Terminal	Voltage Terminal
Input 0	A-0	C-35	Input 8	A-8	C-43
Input 1	A-1	C-36	Input 9	A-9	C-44
Input 2	A-2	C-37	Input 10	A-10	C-45
Input 3	A-3	C-38	Input 11	A-11	C-46
Input 4	A-4	C-39	Input 12	A-12	C-47
Input 5	A-5	C-40	Input 13	A-13	C-48
Input 6	A-6	C-41	Input 14	A-14	C-49
Input 7	A-7	C-42	Input 15	A-15	C-50
Common	B-16 thru B-33		+48V dc	C-34 thru C-51	

2-Wire and 3-Wire Inputs to the 1794-IC16 Module



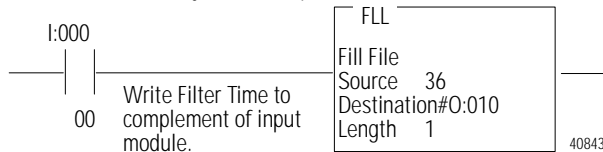
Setting Input Filter Times

This module has a built-in 1ms filter. You can select additional input filter time (FT) for each group of channels (channels 00 through 11, or channels 12 through 15). Select the additional input filter time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to set an additional filter of 4ms for a dc input module at address rack 1, module group 0, set bits 05, 04, 03, 02, 01, and 00 as shown below. This would result in a total filter time of 5ms.

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec. =
O:010											1	0	0	1	0	0	44 Octal or 36 Decimal
											FT1 = 12-15			FT0 = 00-11			

Write Filter Time on system startup.



Input Filter Times (Standard Addressing Mode Only)

Bits			Description	Selected Filter Time
02	01	00	Filter Time for Inputs 00-11 (00-13)	
05	04	03	Filter Time for Inputs 12-15 (14-17)	
0	0	0	Filter Time 0 (default)	256μs
0	0	1	Filter Time 1	512μs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

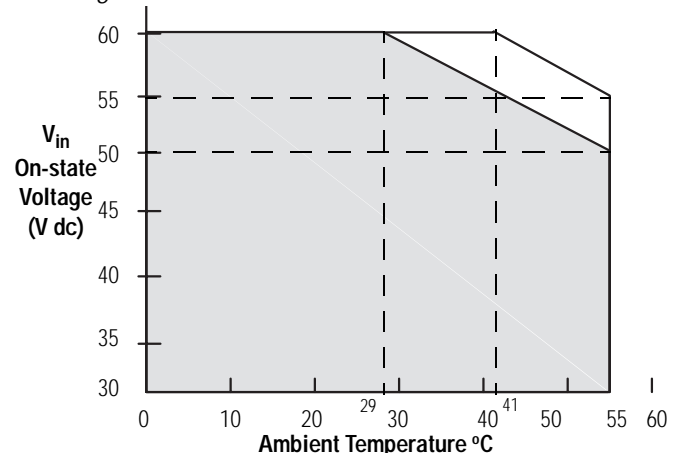
Specifications - 1794-IC16

Number of Inputs	16 (1 group of 16), non-isolated, sinking
Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base Unit
Mounting	Refer to derating curve
ON-State Voltage	30V dc minimum; 48V dc nominal; 60V dc maximum
ON-State Current	2.0mA minimum; 5.0mA nominal at 48V dc; 11.0mA maximum
OFF-State Voltage	10.0V dc maximum
OFF-State Current	1.5mA minimum
Input Impedance	11K Ω maximum
Isolation Voltage	100% tested at 1900V dc for 1s between user and system No isolation between individual channels
Maximum Input Filter Times OFF to ON ON to OFF	Minimum 1ms plus selected filter time of: 256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256μs, 512μs, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms 256μs default - selectable thru output image table (see <i>Setting Input Filter Times</i>)
Flexbus Current (max)	25mA
Power Dissipation	Maximum 6.4W @ 60V dc
Thermal Dissipation	Maximum 21.9 BTU/hr @ 60V dc

Indicators (field side indication, customer device driven)	16 yellow status indicators
Keyswitch Position	2
General Specifications	
External dc Power Supply Voltage Voltage Range Input Supply Current	48V dc nominal 30 to 60V dc (includes 5% ac ripple) 51mA @ 30V 82mA @ 48V 107mA @ 60V
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ¹
Publication Installation Instructions	1794-5.53
Agency Certification	Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Derating Curve

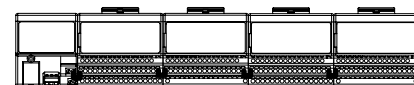


The area within the curve represents the safe operating range for the module under various conditions of user supplied 48V dc supply voltages and ambient temperature.

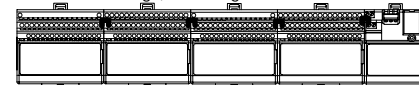
= Normal mounting safe operating range, included
 = Other mounting positions (including inverted horizontal) safe operating range)

41115

Normal Mounting - Horizontal

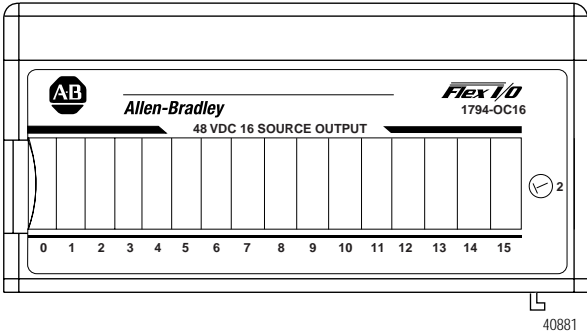





Other Mounting (including Vertical and Inverted Horizontal Mounting)

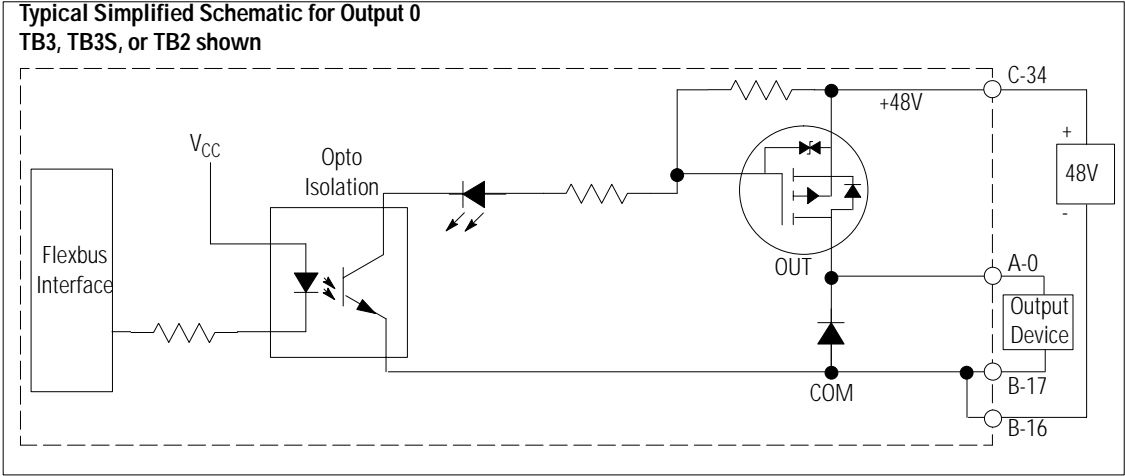


40221

If maximum voltage is 60, the maximum temperature is 41 (normal) 29 (other).
 If maximum voltage is 55, the maximum temperature is 55 (normal) 42 (other).
 If maximum voltage is 50, the maximum temperature is 55 (normal) 55 (other).

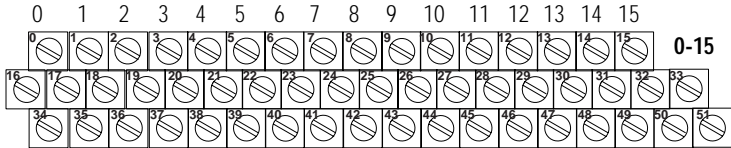


Recommended Terminal Base	Compatible Terminal Base(s)
	 



Wiring

1794-TB3
1794-TB3S
1794-TB2



34 and 51 for TB2




30233

Output	Output Terminal	Common Terminal	Output	Output Terminal	Common Terminal
Output 0	A-0	B-17	Output 8	A-8	B-25
Output 1	A-1	B-18	Output 9	A-9	B-26
Output 2	A-2	B-19	Output 10	A-10	B-27
Output 3	A-3	B-20	Output 11	A-11	B-28
Output 4	A-4	B-21	Output 12	A-12	B-29
Output 5	A-5	B-22	Output 13	A-13	B-30
Output 6	A-6	B-23	Output 14	A-14	B-31
Output 7	A-7	B-24	Output 15	A-15	B-32
Common	B-16 thru B-33		+48V dc	C-34 thru C-51 (C-34 and C-51 for TB2)	

Specifications - 1794-OC16

Number of Outputs	16 (1 group of 16), non-isolated, sourcing
Module Location	Cat. No. 1794-TB3, -TB3S, or -TB2 Terminal Base Unit
ON-State Voltage Range	30V dc minimum 48V dc nominal; 60V dc maximum @ 45°C 55V dc maximum @ 55°C
ON-State Voltage Drop	1.0V dc maximum @ 0.5A
ON-State Current	2.0mA minimum per channel 500mA maximum per channel
OFF-State Voltage	60V dc maximum
OFF-State Leakage	1.0mA maximum
Isolation Voltage (min)	100% tested at 1900V dc for 1s between user and system No isolation between individual channels
Output Signal Delay ¹ OFF to ON ON to OFF	0.5ms maximum 1.0ms maximum @ 25°C 2.0ms maximum @ 55°C
Flexbus Current (max)	80mA
Power Dissipation	3.7W maximum @ 60V
Thermal Dissipation	12.6 BTU/hr @ 60V dc
Indicators (field side indication, logic driven)	16 yellow status indicators
Output Current Rating	8A (16 outputs @ 0.5A)
Surge Current	4A for 10ms, repeatable every 2s
Keyswitch Position	2
Fusing	2.0A, 150V ac MQ2 normal fuse

General Specifications

















External dc Power Supply Voltage Voltage Range Supply Current	48V dc nominal 30 to 60V dc (includes 5% ac ripple) 13mA @ 30V dc 21mA @ 48V dc 27mA @ 60V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7 in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing 30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Publication Installation Instructions	1794-5.54
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified  Class I Zone 2 Group IIC certified

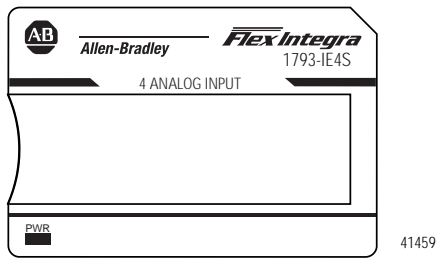
- 1 Off/On delay is the time from a valid output "on" signal to output energization. On/Off delay is the time from a valid output "off" signal to output deenergization.
- 2 You use this conductor category information for planning conductor routing as described in the system level installation manual.

Use the following table to determine which analog module will meet your application needs.

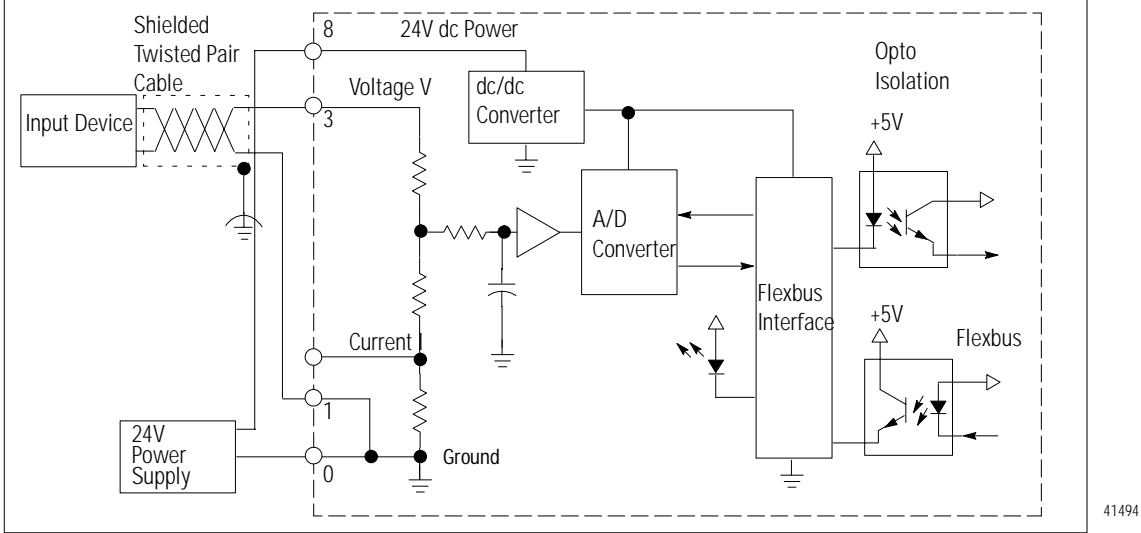
	Analog Module	Purpose	See Page
<i>FLEX Integra</i>	1793-IE4 and -IE4S	24V dc selectable analog 4 input module - 1793-IE4 has screw-clamp terminations while the 1793-IE4S has spring-clamp terminations	91
	1793-OE2 and -OE2S	24V dc selectable analog 2 output module - 1793-OE2 has screw-clamp terminations while the 1793-OE2S has spring-clamp terminations	93
	1793-IE2XOE1 and -IE2XOE1S	24V dc 4 input/2 output analog combo module - 1793-IE2XOE1 has screw-clamp terminations while the 1793-IE2XOE1S has spring-clamp terminations	95
<i>FLEX I/O</i>	1794-IE8/B	24V dc selectable analog 8 input module	98
	1794-OE4/B	24V dc selectable analog 4 output module	100
	1794-IE4XOE2/B	24V dc 4 input/2 output analog combo module	103

The following table illustrates the recommended terminal base unit(s) for each analog module.

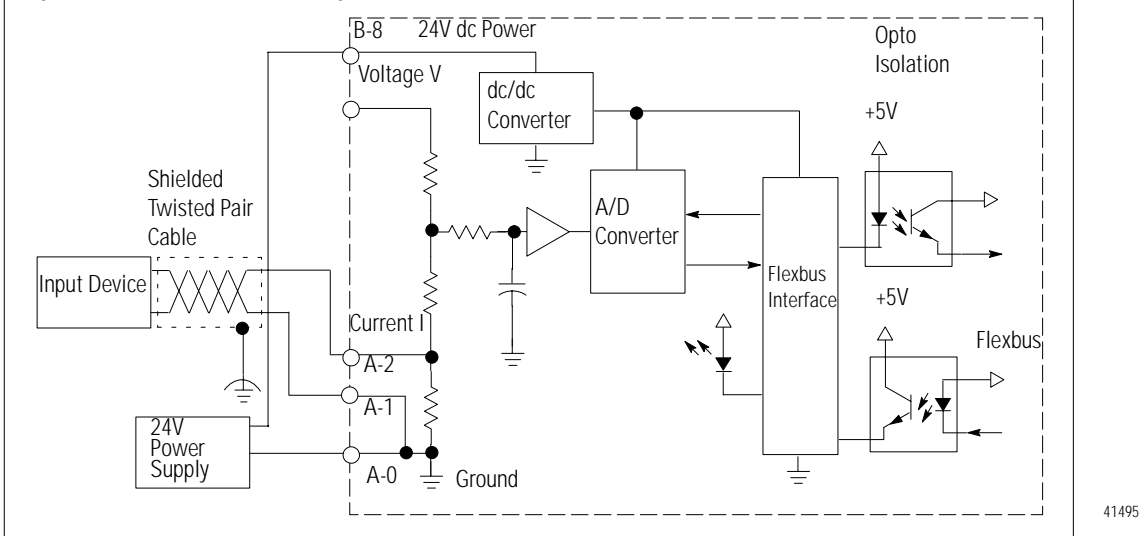
FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
Analog			
24V dc Modules	1794-IE8/B		   
	1794-OE4/B		    
	1794-IE4XOE2/B		   



Simplified Schematic of Voltage Input 0



Simplified Schematic of Current Input 0

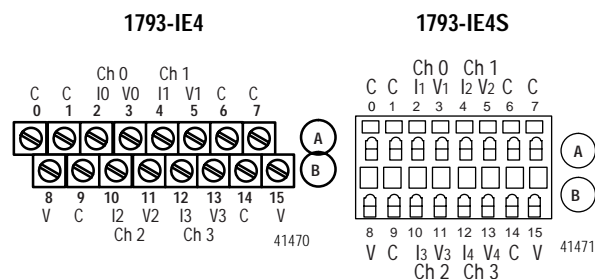


ATTENTION

Only connect either a voltage input or a current input per channel, not both.



Wiring



Where: V = 24V dc; C = 24V dc common; In = current in; Vn = voltage in

Channel	Signal Type	Label Markings	Input Terminal	Common Terminal
0	Current	I	A-2	A-1
	Voltage	V	A-3	
1	Current	I	A-4	A-6
	Voltage	V	A-5	
2	Current	I	B-10	B-9
	Voltage	V	B-11	
3	Current	I	B-12	B-14
	Voltage	V	B-13	
24V dc	Terminals 8 and 15 are internally connected together in the module			
24V dc common	Terminals 0, 1, 6, 7, 9 and 14 are internally connected together in the module			

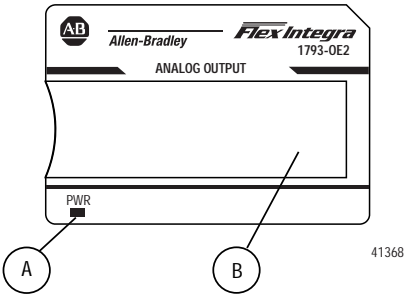
Specifications - 1793-IE4 and -IE4S

Module Type	4 analog inputs 1793-IE4 - 16 screw-cage terminals 1793-IE4S - 16 spring-clamp terminals
Module Location	DIN rail mounting
Number of Channels	4
Data Format	16-bit 2's complement, left-justified
Conversion Type	Successive approximation
Conversion Rate	256µs all channels
Resolution	12-bits - unipolar; 11-bit plus sign - bipolar
Voltage	2.56mV/cnt unipolar; 5.13mV/cnt bipolar
Current	5.13µA/cnt
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable)
Normal Mode Rejection Ratio	-3db @ 17Hz; -20db/decade
Voltage Terminal	-10db @ 50Hz; -11.4db @ 60Hz
Current Terminal	-3db @ 17Hz; -20db/decade -15.3db @ 50Hz; -16.8db @ 60Hz
Step Response to 63%	9.4ms
Voltage Terminal	18.2ms
Current Terminal	

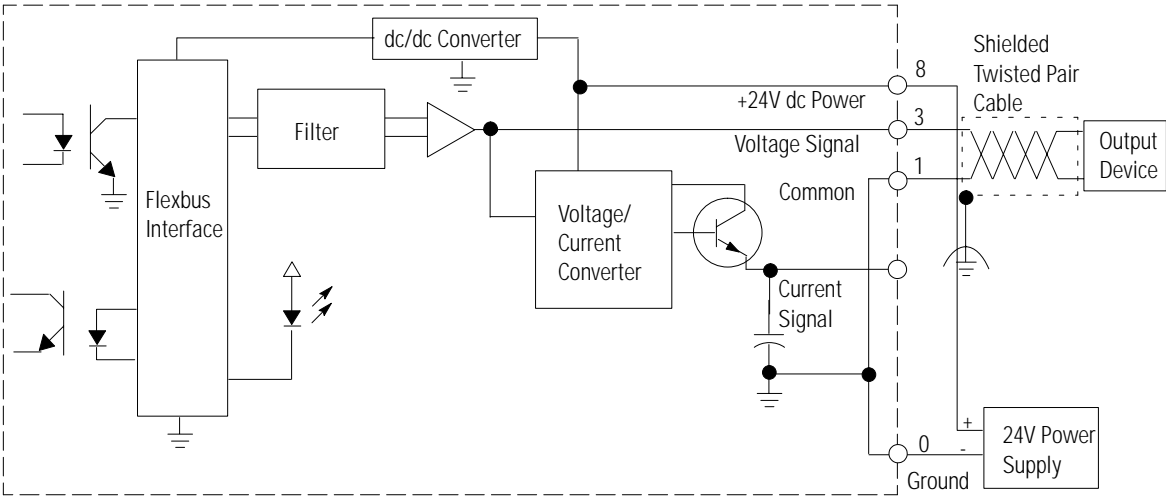
Specifications - 1793-IE4 and -IE4S (continued)

Impedance	100K Ω; 200K Ω @ dc
Voltage Terminal	238Ω
Current Terminal	
Absolute Accuracy	
Voltage Terminal	0.20% FS @ 25°C
Current Terminal	0.20% FS @ 25°C
Accuracy Drift	
Voltage Terminal	0.00428% FS per °C
Current Terminal	0.00407% FS per °C
Maximum Overload	Single channel, continuous
Voltage Terminal	30V
Current Terminal	32mA
Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - None
Flexbus Current	20mA maximum
Power Dissipation	1.0W @ 31.2V dc
Thermal Dissipation	3.4 BTU/hr @ 31.2V dc
Indicators	1 green power indicators
External dc PowerVoltage	19.2-31.2V dc (5% ac ripple)
Current	60mA maximum
Dimensions (HxWxD)	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	
Operational Temperature	0 to +55°C (32 to +131°F)
Storage Temperature	-40 to +85°C (-40 to +185°F)
Relative Humidity	5 to 95% noncondensing
Shock	Tested to 30g peak acceleration, 11(+1)ms pulse width
Operating	Tested to 50g peak acceleration, 11(+1)ms pulse width
Nonoperating	Tested 5g @ 10-500Hz per IEC68-2-6
Vibration	
ConductorsWire Size	12 gauge (4mm ²) stranded wire 3/64 in (1.2mm) maximum insulation, 90°C min. temperature rating
Category ¹	2
Terminal Screw Torque	4-7 inch-pounds
Publications	
Installation Instructions	1793-5.4
Agency Certification	

¹ Use this category information for planning conductor routing as described in publication 1770-4.1, "Wiring and Grounding Guidelines for Noise Immunity."

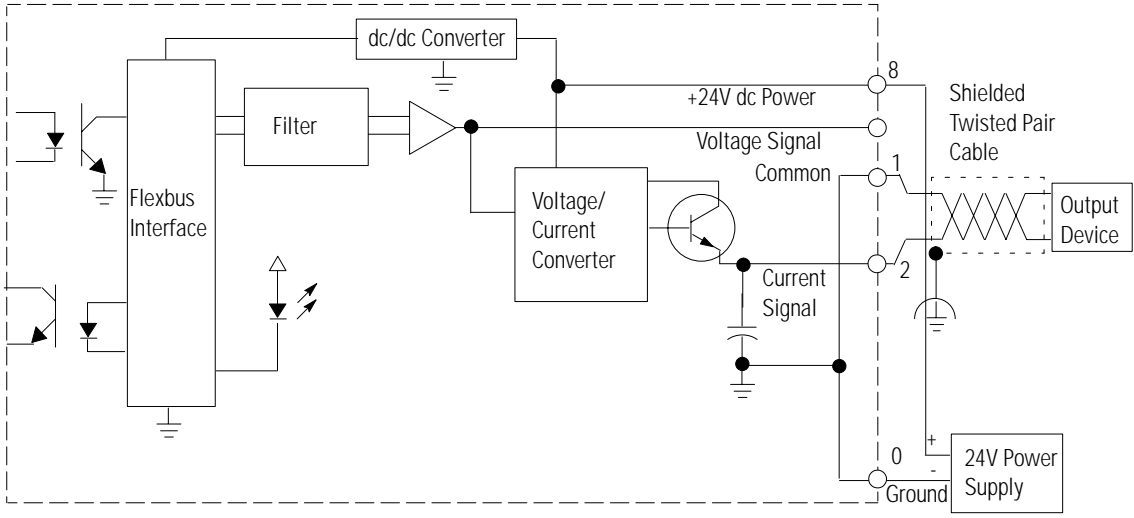


Simplified Schematic of Voltage Output 0



41496

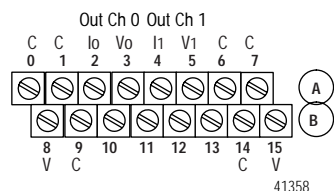
Simplified Schematic of Current Output 0



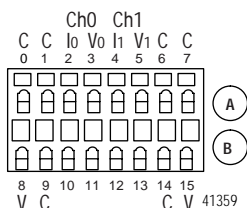
41497

Wiring

1793-OE2



1793-OE2



Where: V = 24V dc power; C = common; I = current output; V = voltage output

Channel	Type	Label Markings	Signal	Return
0	Current Signal	I	A-2	
	Current Common	RET		A-1
	Voltage Signal	I	A-3	
	Voltage Common	RET		A-1
1	Current Signal	I	A-4	
	Current Common	RET		A-6
	Voltage Signal	I	A-5	
	Voltage Common	RET		A-6
24V dc	Terminals 8 and 15			
24V dc Common	Terminals 0, 1, 6, 7, 9 and 14.			

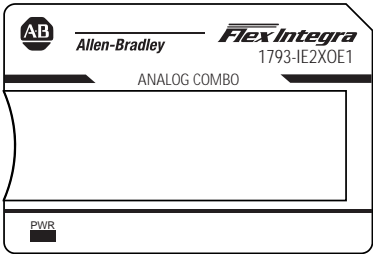
Specifications - 1793-OE2 and -OE2S

Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - None
General	
Flexbus Current	20mA maximum
Power Dissipation	2.5W @ 31.2V dc
Thermal Dissipation	8.5 BTU/hr @ 31.2V dc
Indicators	1 green power indicators
External dc PowerVoltage Current	19.2-31.2V dc (5% ac ripple) 70mA maximum
Dimensions (HxWxD)	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	
Operational Temperature	0 to +55°C (32 to +131°F)
Storage Temperature	-40 to +85°C (-40 to +185°F)
Relative Humidity	5 to 95% noncondensing
Shock	Tested to 30g peak acceleration, 11(+1)ms pulse width
Operating	Tested to 50g peak acceleration, 11(+1)ms pulse width
Nonoperating	Tested 5g @ 10-500Hz per IEC68-2-6
Vibration	
ConductorsWire Size	12 gauge (4mm ²) stranded wire 3/64 in (1.2mm) maximum insulation, 90°C min. temperature rating
Category ¹	2
Terminal Screw Torque	4-7 inch-pounds
Publications Installation Instructions	1793-5.5
Agency Certification	

¹ Use this category information for planning conductor routing as described in publication 1770-4.1, "Wiring and Grounding Guidelines for Noise Immunity."

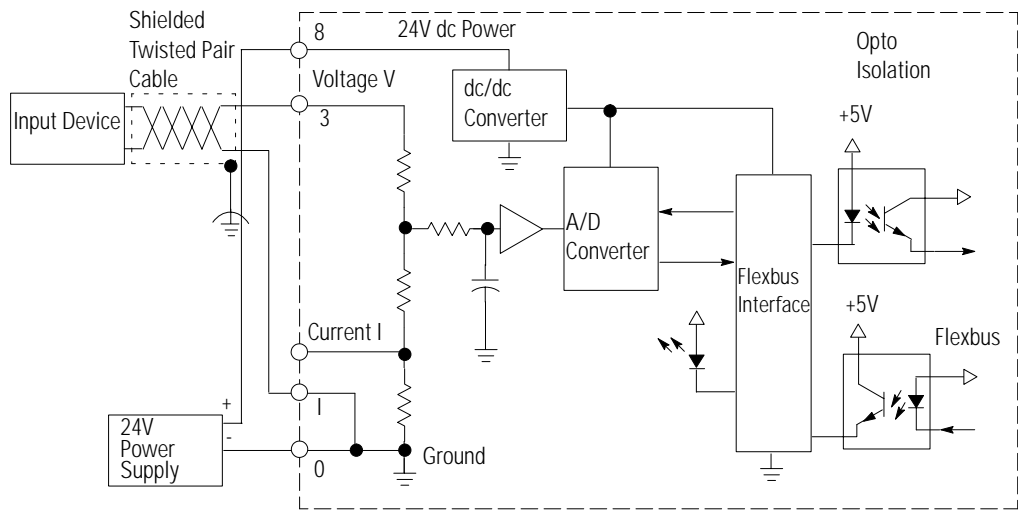
Specifications - 1793-OE2 and -OE2S

Module Type	2 analog output 1793-OE2 - 16 screw-cage terminals 1793-OE2S - 16 spring-clamp terminals
Module Location	DIN rail mounting
Number of Channels	2 out - nonisolated
Output	
Resolution	12-bits plus sign
Voltage	2.56mV/cnt
Current	5.13µA/cnt
Data Format	Left justified 16-bit 2's complement
Conversion Type	Pulse width modulation
Conversion Rate	1.024ms all channels
Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Voltage Terminal	±10V (user configurable) 0-10V (user configurable) 3mA maximum
Step Response to 63%	
Voltage Terminal	24ms
Current Terminal	24ms
Impedance	
Voltage Terminal	15-750 Ω resistive
Current Terminal	15-750 Ω resistive
Absolute Accuracy	
Voltage Terminal	0.133% FS @ 25°C
Current Terminal	0.425% FS @ 25°C
Accuracy Drift	
Voltage Terminal	0.0045% FS per °C
Current Terminal	0.0069% FS per °C



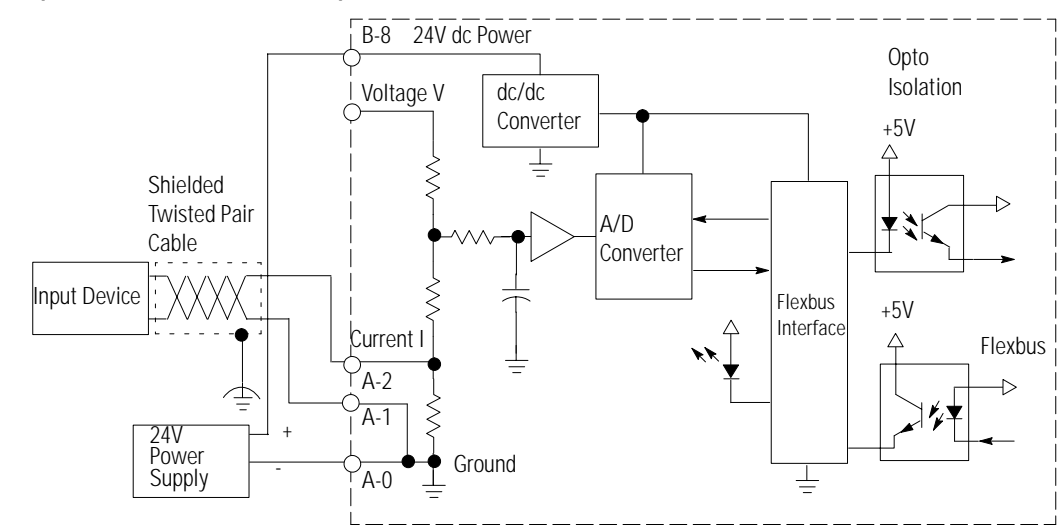
41492

Simplified Schematic of Voltage Input 0

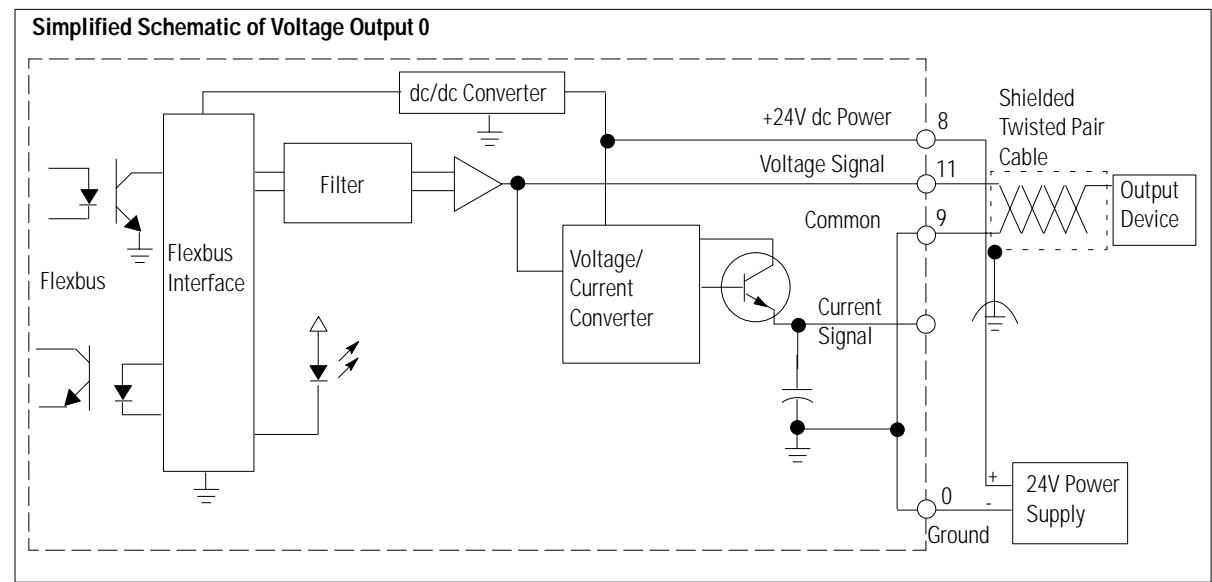


41494

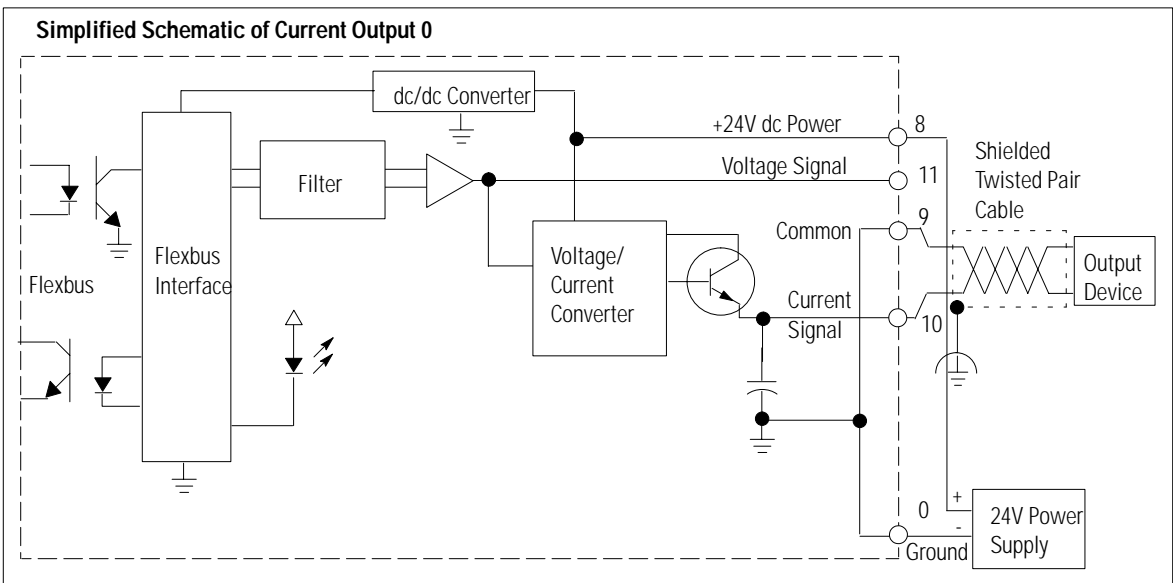
Simplified Schematic of Current Input 0



41495



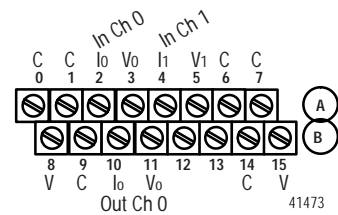
41496



41497

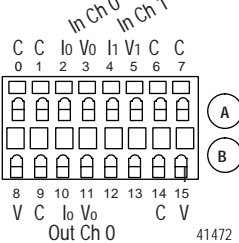
Wiring

1793-IE2XOE1



41473

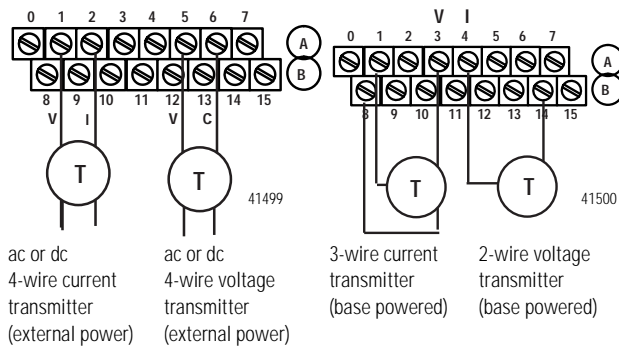
1793-IE2XOE1S



41472

Where: C = common; V = +24V dc power; $I_{0,1}$ = current in; $V_{0,1}$ = voltage in;
 I_o = current out; V_o = voltage out

Channel	Signal Type	Label Markings	Signal	Return
Input				
0	Current	I	A-2	A-1
	Voltage	V	A-3	
1	Current	I	A-4	A-6
	Voltage	V	A-5	
Output				
0	Current	I	B-10	B-9
	Voltage	V	B-11	
+24V dc	Terminals 8 and 15 are internally connected to +V.			
24V dc common	Terminals 0, 1, 6, 7, 9, 14 are internally connected together in the module.			

**ATTENTION**

Use a 100Ω, 25W or greater, resistor when connecting to a low-impedance device, i.e., panel meter. Failure to do so can result in damage to output circuitry.

Specifications - 1793-IE2XOE1 and -IE2XOE1S

Module Type	2 analog inputs, 1 analog output 1793-IE2XOE1 - 16 screw-cage terminals 1793-IE2XOE1S - 16 spring-clamp terminals
Module Location	DIN rail mounting
Number of Channels	3 - 2 in, 1 out - nonisolated
Input	
Resolution Voltage Current	12-bits - unipolar; 11-bit plus sign - bipolar 2.56mV/cnt unipolar; 5.13mV/cnt bipolar 5.13μA/cnt
Data Type	left justified 16-bit 2's complement
Conversion Type	Successive approximation
Conversion Rate	256μs all channels
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable)
Normal Mode Rejection Ratio Voltage Terminal Current Terminal	-3db @ 17Hz; -20db/decade -10db @ 50Hz; -11.4db @ 60Hz -3db @ 17Hz; -20db/decade -15.3db @ 50Hz; -16.8db @ 60Hz
Step Response to 63% Voltage Terminal Current Terminal	9.4ms 18.2ms
Impedance Voltage Terminal Current Terminal	9.4ms100K Ω; 200K Ω @ dc 238Ω
Absolute Accuracy Voltage Terminal Current Terminal	0.20% FS @ 25°C 0.20% FS @ 25°C
Accuracy Drift Voltage Terminal Current Terminal	0.00428% FS per °C 0.00407% FS per °C
Maximum Overload Voltage Terminal Current Terminal	Single channel, continuous 30V 32mA

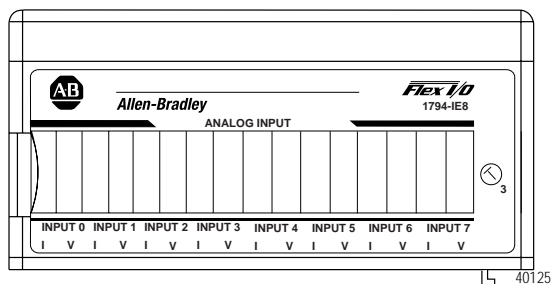
Specifications - 1793-IE2XOE1 and -IE2XOE1S**Output**

Resolution Voltage Current	12-bits plus sign 2.56mV/cnt 5.13μA/cnt
Data Type	left justified 16-bit 2's complement
Conversion Type	Pulse width modulation
Conversion Rate	1.024ms all channels
Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Voltage Terminal	±10V (user configurable) 0-10V (user configurable) 3mA maximum
Step Response to 63% Voltage Terminal Current Terminal	24ms 24ms
Impedance Voltage Terminal Current Terminal	15-750 Ω resistive 15-750 Ω resistive
Absolute Accuracy Voltage Terminal Current Terminal	0.133% FS @ 25°C 0.425% FS @ 25°C
Accuracy Drift Voltage Terminal Current Terminal	0.0045% FS per °C 0.0069% FS per °C

General Specifications

Dielectric Withstand Test	Channel to system - 850V dc for 1s Channel to channel - None
Flexbus Current	20mA maximum
Power Dissipation	2.5W @ 31.2V dc
Thermal Dissipation	8.5 BTU/hr @ 31.2V dc
Indicators	1 green power indicators
External dc Power/Voltage Current	19.2-31.2V dc (5% ac ripple) 100mA maximum
Dimensions (HxWxD)	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Nonoperating	0 to +55°C (32 to +131°F) -40 to +85°C (-40 to +185°F) 5 to 95% noncondensing Tested to 30g peak acceleration, 11(+1)ms pulse width Tested to 50g peak acceleration, 11(+1)ms pulse width Tested 5g @ 10-500Hz per IEC68-2-6
Vibration	
Conductors/Wire Size	12 gauge (4mm ²) stranded wire 3/64 in (1.2mm) maximum insulation, 90°C min. temperature rating
Category ¹	2
Terminal Screw Torque	4-7 inch-pounds
Publications Installation Instructions	1793-5.6
Agency Certification	

¹ Use this category information for planning conductor routing as described in publication 1770-4.1, "Wiring and Grounding Guidelines for Noise Immunity."



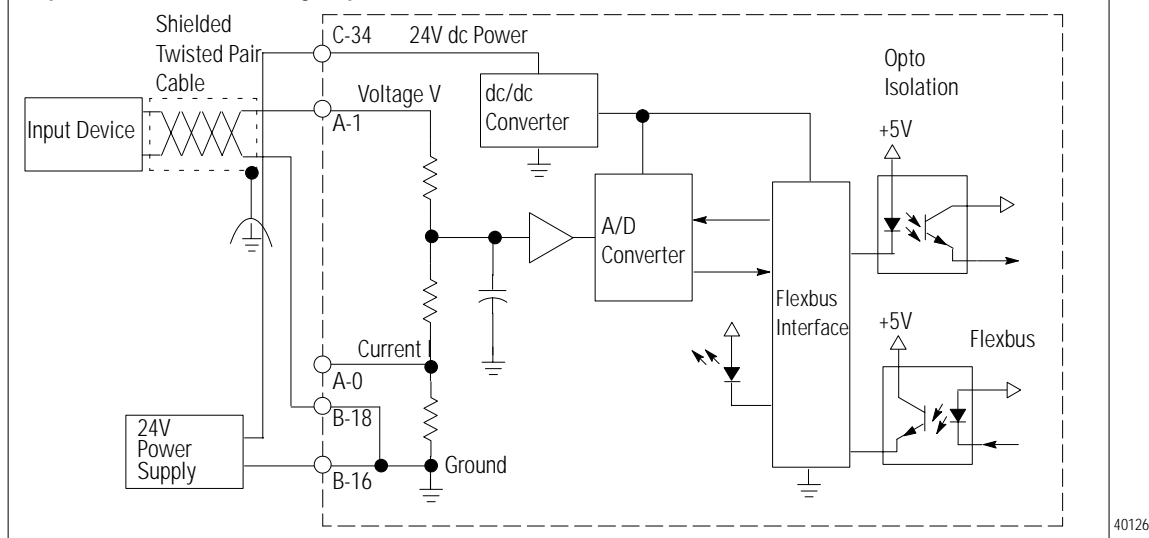
Recommended Terminal Base



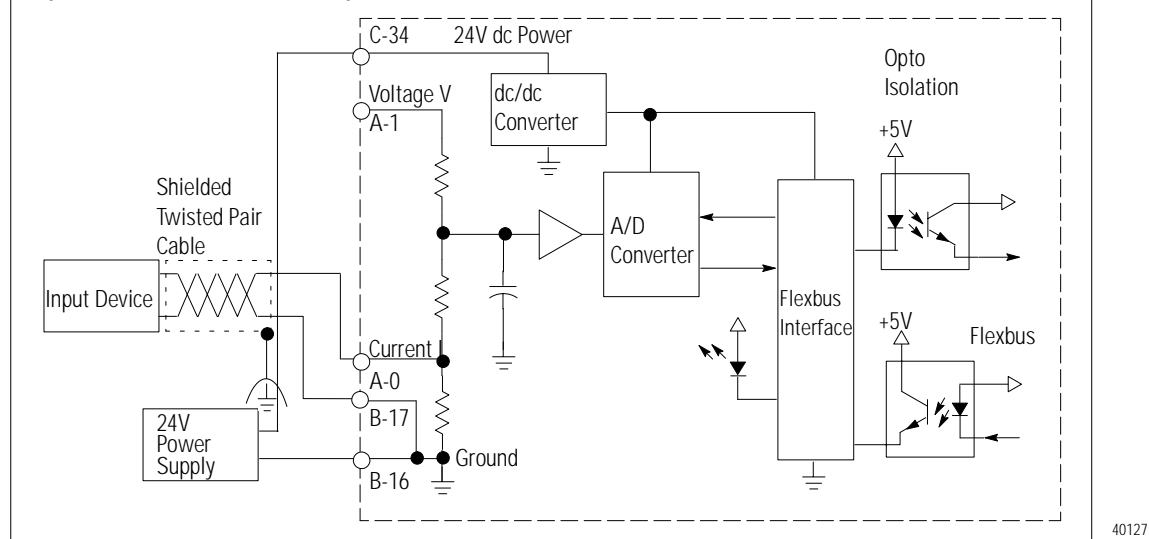
Compatible Terminal Base(s)



Simplified Schematic of Voltage Input 0 TB3, TB3S, TB2, TB3T, or TB3TS shown



Simplified Schematic of Current Input 0 TB3, TB3S, TB2, TB3T, or TB3TS shown



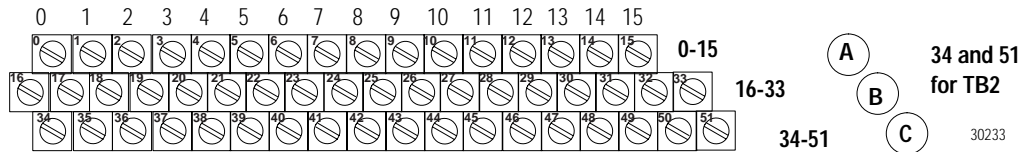
ATTENTION

Only connect either a voltage input or a current input per channel, not both.



Wiring

1794-TB3
1794-TB3S
1794-TB2
1794-TB3T
1794-TB3TS



		TB3, TB3S, TB2, TB3T, TB3TS	TB3, TB3S, TB2	TB3T, TB3TS				TB3, TB3S, TB2, TB3T, TB3TS	TB3, TB3S, TB2	TB3T, TB3TS	
Channel	Signal Type	Input Terminals	Common Terminals		Shield	Channel	Signal Type	Input Terminals	Common Terminals		Shield
0	Current	A-0	B-17	B-17	C-39	4	Current	A-8	B-25	B-25	C-43
	Voltage	A-1	B-18	B-17	C-39		Voltage	A-9	B-26	B-25	C-43
1	Current	A-2	B-19	B-19	C-40	5	Current	A-10	B-27	B-27	C-44
	Voltage	A-3	B-20	B-19	C-40		Voltage	A-11	B-28	B-27	C-44
2	Current	A-4	B-21	B-21	C-41	6	Current	A-12	B-29	B-29	C-45
	Voltage	A-5	B-22	B-21	C-41		Voltage	A-13	B-30	B-39	C-45
3	Current	A-6	B-23	B-23	C-42	7	Current	A-14	B-31	B-31	C-46
	Voltage	A-7	B-24	B-23	C-42		Voltage	A-15	B-32	B-31	C-46
24V dc Common for TB2, TB3, TB3S: B-16 thru B-33 24V dc Common for TB3T and TB3TS: B-16, 17, 19, 21, 23, 25, 27, 29, 31, and 33						+24V dc Power for TB2: C-34 and C-51; +24V dc Power for TB3 and TB3S: C-34 thru C-51 +24V dc Power for TB3T and TB3TS: C-34, 35, 50, and 51					

Specifications - 1794-IE8/B

Number of Inputs	8 single-ended, non-isolated
Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, or -TB3TS Terminal Base Unit
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable)
Resolution Voltage Current	12 bits - unipolar; 11 bits plus sign - bipolar 2.56mV/cnt unipolar; 5.13mV/cnt bipolar 5.13µA/cnt
Input Impedance Voltage Terminal Current Terminal	100k Ω 238 Ω
Input Resistance Voltage Terminal Current Terminal	200k Ω 238 Ω
Isolation Voltage	Tested at 850V dc for 1s between user and system No isolation between individual channels
Flexbus Current	20mA @ 5V dc
Power Dissipation	3W maximum @ 31.2V dc
Thermal Dissipation	Maximum 10.2 BTU/hr @ 31.2V dc
Indicators	1 green power indicator
Keyswitch Position	3
Data Format	Left justified 16-bit 2's complement
Conversion Type	Successive approximation
Conversion Rate	256µs all channels
Normal Mode Rejection Ratio Voltage Terminal	-3db @ 17Hz; -20db/decade -10.0dB @ 50Hz; -11.4dB @ 60Hz
Current Terminal	-3db @ 9Hz; -20db/decade -15.3dB @ 50Hz; -16.8dB @ 60Hz
Calibration	None Required
Step Response to 63% Voltage Terminal Current Terminal	9.4ms 18.2ms

Specifications - 1794-IE8/B (continued)

Absolute Accuracy ¹ Voltage Terminal Current Terminal	0.20% Full Scale @ 25°C 0.20% Full Scale @ 25°C
Accuracy Drift w/Temp. Voltage Terminal Current Terminal	0.00428% Full Scale/°C 0.00407% Full Scale/°C
Maximum Overload	30V or 32mA continuous, 1 channel at a time

General Specifications

External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 60mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ²
Publications Installation Instructions User Manual	1794-5.6 1794-6.5.2
Agency Certification	Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified

¹ Includes offset, gain, non-linearity and repeatability error terms.

² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Wiring

1794-TB3

1794-TB3S

1794-TB2

1794-TB3T

1794-TB3TS

0123456789101112131415

015

1633

3451

A

B

C

34 and 51 for TB2

30233

		TB3, TB3S, TB2, TB3T, TB3TS	TB3T, TB3TS			TB3, TB3S, TB2, TB3T, TB3TS	TB3T, TB3TS
Channel	Signal Type	Output Terminals	Shield	Channel	Signal Type	Input Terminals	Shield
0	Current Signal	A-0	C-39	2	Current Signal	A-8	C-43
	Current Common	A-1 ¹	C-39		Current Common	A-9 ¹	C-43
	Voltage Signal	A-2	C-40		Voltage Signal	A-10	C-44
	Voltage Common	A-3 ¹	C-40		Voltage Common	A-11 ¹	C-44
1	Current Signal	A-4	C-41	3	Current Signal	A-12	C-45
	Current Common	A-5 ¹	C-41		Current Common	A-13 ¹	C-45
	Voltage Signal	A-6	C-42		Voltage Signal	A-14	C-46
	Voltage Common	A-7 ¹	C-42		Voltage Common	A-15 ¹	C-46

24V dc Common for TB2, TB3, TB3S: B-16 thru B-33

24V dc Common for TB3T and TB3TS: B-16, 17, 19, 21, 23, 25, 27, 29, 31, and 33

+24V dc Power for TB2: C-34 and C-51

+24V dc Power for TB3 and TB3S: C-34 thru C-51

+24V dc Power for TB3T and TB3TS: C-34, 35, 50, and 51

1

A-1, 3, 5, 7, 9, 11, 13, and 15 are internally connected in the module to 24V dc common.

1794-TBN

16

Even Numbered Terminals 0 thru 14

33

160246810121433

341357911131551

16, 0, 2, 4, 6, 8, 10, 12, 14, 33

34, 1, 3, 5, 7, 9, 11, 13, 15, 51

B

C

41018

34

Odd Numbered Terminals 1 thru 15

51




Channel	Type	Output Terminal	Channel	Type	Output Terminal
0	Current Signal	B-0	2	Current Signal	B-8
	Current Common	C-1		Current Common	C-9
	Voltage Signal	B-2		Voltage Signal	B-10
	Voltage Common	C-3		Voltage Common	C-11
1	Current Signal	B-4	3	Current Signal	B-12
	Current Common	C-5		Current Common	C-13
	Voltage Signal	B-6		Voltage Signal	B-14
	Voltage Common	C-7		Voltage Common	C-15
24V dc Common		B-16 and B-33	+24V dc		C34 and C-51

Publication 1794-2.1 - January 2000

Specifications - 1794-OE4/B

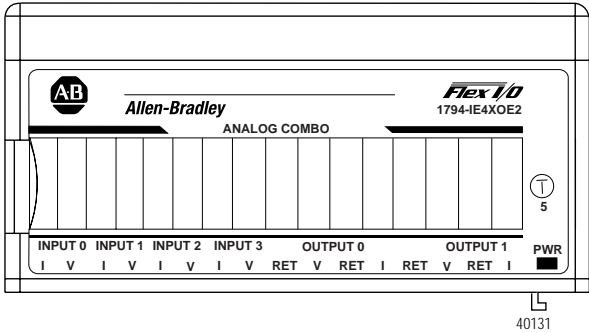
Number of Outputs	4 single-ended, non-isolated
Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, -TB3TS, or -TBN Terminal Base Unit
Resolution Voltage Current	12 bits plus sign 2.56mV/cnt 5.13µA/cnt
Data Format	Left justified 16-bit 2's complement
Conversion Type	Pulse Width Modulation
Conversion Rate	1.024ms maximum all channels
Output Current Terminal	0mA output until module is configured 4-20mA user configurable 0-20mA user configurable
Output Voltage Terminal	0V output until module is configured ±10V user configurable 0-10V user configurable
Step Response to 63% of FS	24ms
Current Load on Voltage Output	Maximum 3mA
Resistive Load on mA Output	15 - 750 Ω
Absolute Accuracy ¹ Voltage Terminal Current Terminal	0.133% Full Scale @ 25°C 0.425% Full Scale @ 25°C
Accuracy Drift with Temperature Voltage Terminal Current Terminal	0.0045% Full Scale/°C 0.0069% Full Scale/°C
Calibration	None required
Isolation Voltage	Tested at 850V dc for 1s between user and system No isolation between individual channels
Indicators	1 green power indicator
Flexbus Current	20mA @ 5V dc
Power Dissipation	Maximum 4.5W @ 31.2V dc
Thermal Dissipation	Maximum 15.3 BTU/hr @ 31.2V dc
Keyswitch Position	4






General Specifications

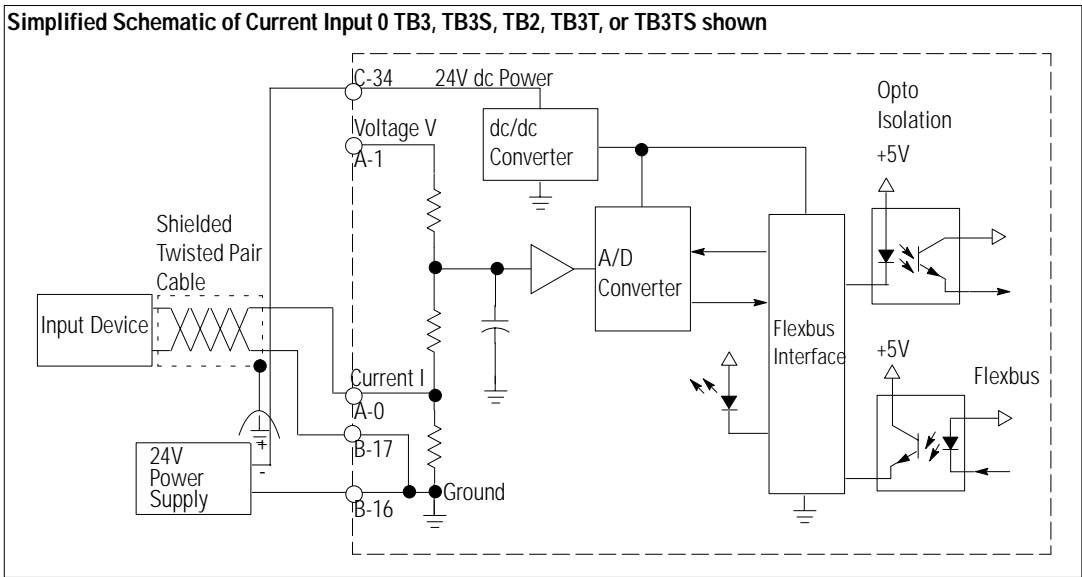
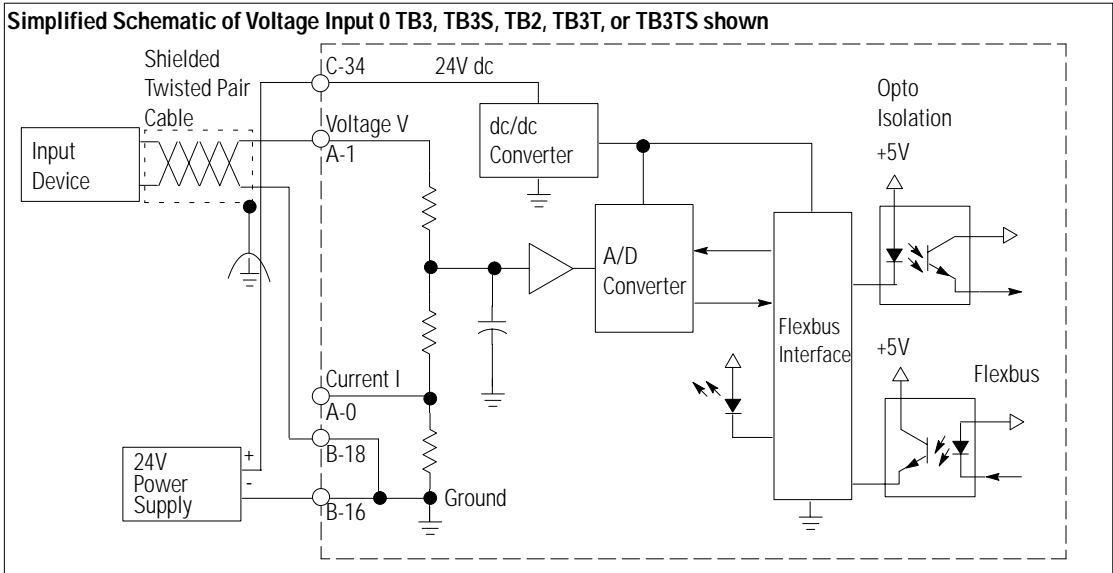
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 70mA @ 24V dc (not including outputs)
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ²
Publications Installation Instructions User Manual	1794-5.5 1794-6.5.2
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

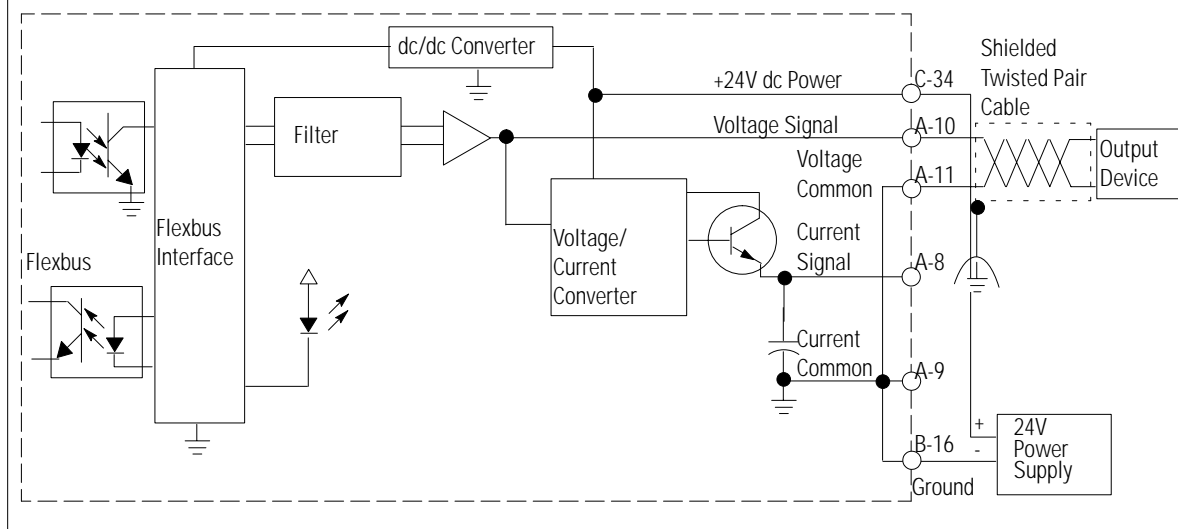
¹ Includes offset, gain, non-linearity and repeatability error terms.

² Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

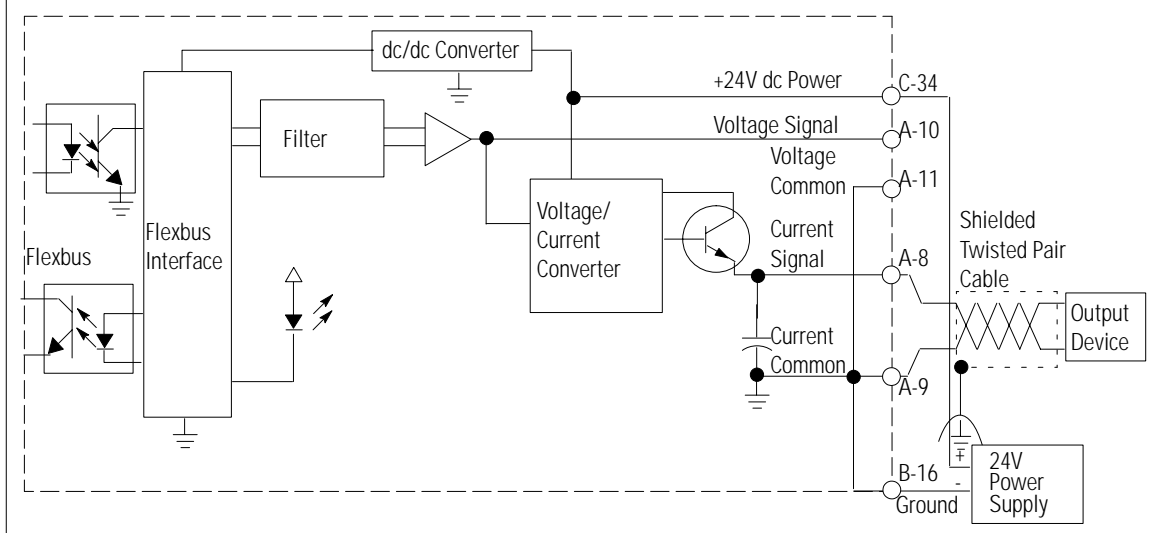


Recommended Terminal Base	Compatible Terminal Base(s)				
					



Simplified Schematic of Voltage Output 0 TB3, TB3S, TB2, TB3T, or TB3TS shown

40134

Simplified Schematic of Current Output 0 TB3, TB3S, TB2, TB3T, or TB3TS shown

40135

Wiring

1794-TB3

1794-TB3S

1794-TB2

1794-TB3T

1794-TB3TS

0123456789101112131415

015

1633

3451

A

B

C

34 and 51 for TB2

30233

		TB3, TB3S, TB2, TB3T, TB3TS	TB3, TB3S, TB2	TB3T, TB3TS				TB3, TB3S, TB2, TB3T, TB3TS	TB3T, TB3TS
Channel	Signal Type	Input Terminals	Common Terminals		Shield	Channel	Signal Type	Output Terminals	Shield
In 0	Current	A-0	B-17	B-17	C-39	Out 0	Current Signal	A-8	C-43
	Voltage	A-1	B-18	B-17	C-39		Current Common	A-9 ¹	C-43
In 1	Current	A-2	B-19	B-19	C-40		Voltage Signal	A-10	C-44
	Voltage	A-3	B-20	B-19	C-40		Voltage Common	A-11 ¹	C-44
In 2	Current	A-4	B-21	B-21	C-41	Out 1	Current Signal	A-12	C-45
	Voltage	A-5	B-22	B-21	C-41		Current Common	A-13 ¹	C-45
In 3	Current	A-6	B-23	B-23	C-42		Voltage Signal	A-14	C-46
	Voltage	A-7	B-24	B-23	C-42		Voltage Common	A-15 ¹	C-46

24V dc Common for TB2, TB3, TB3S: B-16 thru B-33

24V dc Common for TB3T and TB3TS: B-16, 17, 19, 21, 23, 25, 27, 29, 31, and 33

+24V dc Power for TB2: C-34 and C-51;

+24V dc Power for TB3 and TB3S: C-34 thru C-51

+24V dc Power for TB3T and TB3TS: C-34, 35, 50, and 51

1

A-9, 11, 13, and 15 are internally connected in the module to 24V dc common.

Specifications - 1794-IE4XOE2/B

Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, -TB3TS Terminal Base Unit
Isolation Voltage	Tested at 850V dc for 1s between user and system No isolation between individual channels
Flexbus Current	20mA
Power Dissipation	4.0W maximum @ 31.2V dc
Thermal Dissipation	Maximum 13.6 BTU/hr @ 31.2V dc
Keyswitch Position	5
Indicators	1 green power indicator
Calibration	None Required

Input Specifications

Number of Inputs	4 single-ended, non-isolated
Resolution Voltage Current	12 bits - unipolar; 11 bits plus sign - bipolar 2.56mV/cnt unipolar; 5.13mV/cnt bipolar 5.13µA/cnt
Data Format	Left justified 16-bit 2's complement
Conversion Type	Successive approximation
Conversion Rate	256µs all channels
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable)
Step Response to 63% Voltage Terminal Current Terminal	9.4ms 18.2ms
Absolute Accuracy ² Voltage Terminal Current Terminal	0.20% Full Scale @ 25°C 0.20% Full Scale @ 25°C
Accuracy Drift with Temperature Voltage Terminal Current Terminal	0.00428% Full Scale/°C 0.00407% Full Scale/°C
Normal Mode Rejection Ratio Voltage Terminal Current Terminal	-3db @ 17Hz; -20db/decade -10.0dB @ 50Hz, -11.4dB @ 60Hz -3db @ 9Hz; -20db/decade -15.3dB @ 50Hz, -16.8dB @ 60Hz
Input Impedance Voltage Voltage Terminal Current Terminal	100k Ω 238 Ω
Input Resistance Voltage Voltage Terminal Current Terminal	200k Ω 238 Ω
Maximum Overload	30V continuous or 32mA continuous, one channel at a time




Output Specifications

Number of Outputs	2 single-ended, non-isolated
Resolution Voltage Current	12 bits plus sign 2.56mV/cnt 5.13µA/cnt
Data Format	Left justified 16-bit 2's complement
Conversion Type	Pulse Width Modulation

Output Specifications (continued)

Conversion Rate	1.024ms maximum all channels
Output Current Terminal	0mA output until module is configured 4-20mA user configurable 0-20mA user configurable
Output Voltage Terminal	0V output until module is configured ±10V user configurable 0-10V user configurable
Step Response to 63% of FS	24ms
Absolute Accuracy ¹ Voltage Terminal Current Terminal	0.133% Full Scale @ 25°C 0.425% Full Scale @ 25°C
Accuracy Drift with Temperature Voltage Terminal Current Terminal	0.0045% Full Scale/°C 0.0069% Full Scale/°C
Current Load on Voltage Output	3mA maximum
Resistive Load on mA Output	15 - 750 Ω

General Specifications

External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 70mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (nonoperating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ¹
Category	
Publications Installation Instructions User Manual	1794-5.5 1794-6.5.2
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 



















¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

² Includes offset, gain, non-linearity and repeatability error terms.

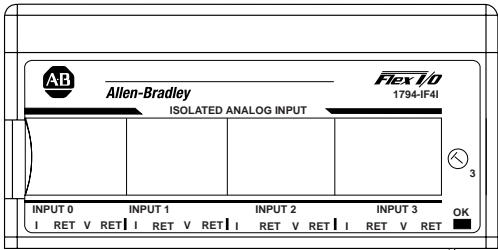
Use the following table to determine which isolated analog module will meet your application needs.

Analog Module	Purpose	See Page
1794-IF4I	24V dc isolated analog 4 input module	108
1794-OF4I	24V dc isolated analog 4 output module	111
1794-IF2XOF2I	24V dc 2 input/2 output isolated analog combo module	114







The following table illustrates the recommended terminal base unit(s) for each analog module.

FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
Analog			
24V dc Modules	1794-IF4I		    
	1794-OF4I		    
	1794-IF2XOF2I	 *	    

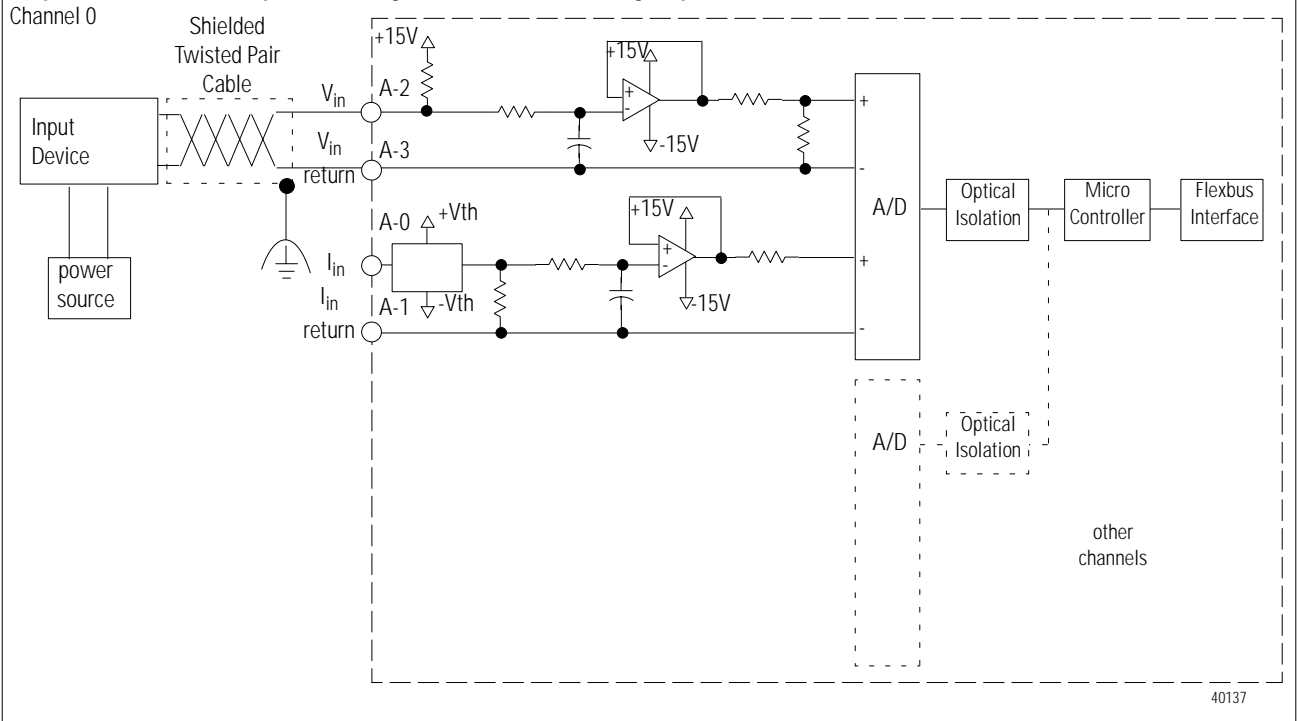
* The TB3T provides convenient ground terminations but fewer dc common terminations.



40136

Recommended Terminal Base	Compatible Terminal Base(s)					
						

Simplified Schematic of Input 0 Showing Connections for a Voltage Input TB3, TB3S, TB2, TB3T, TB3TS shown

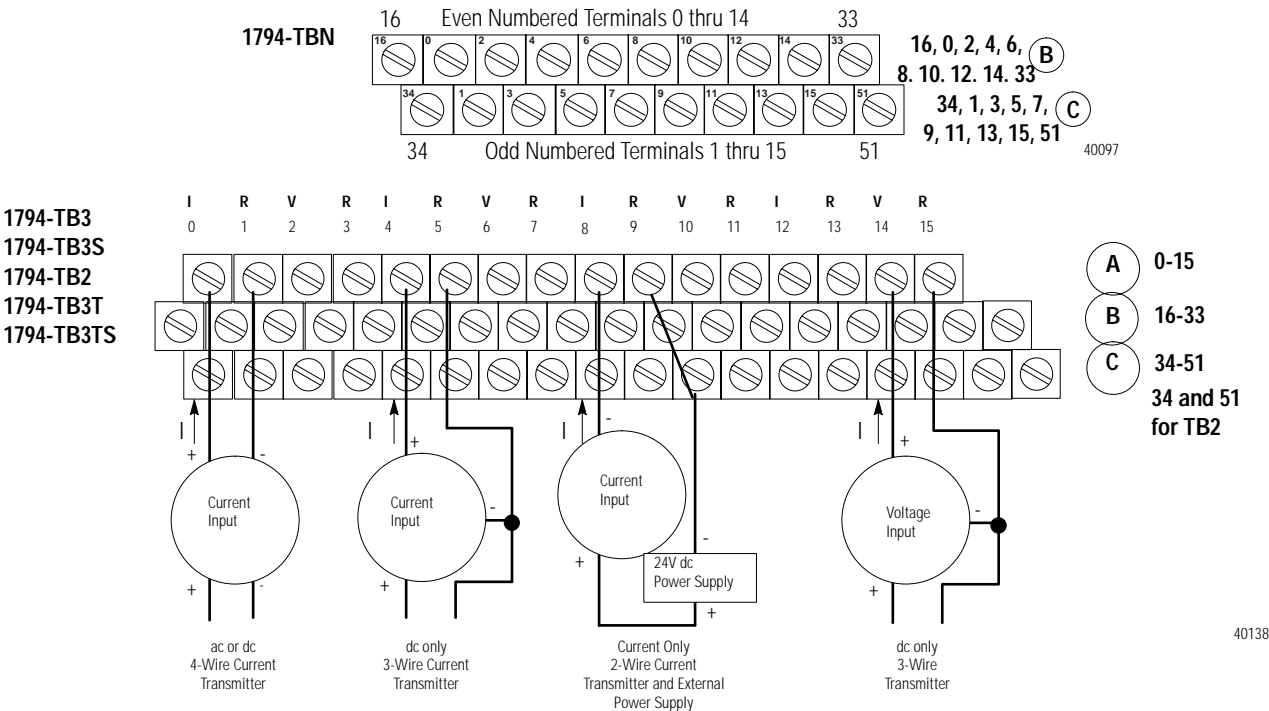


ATTENTION






Only connect either a voltage input or a current input per channel, not both.

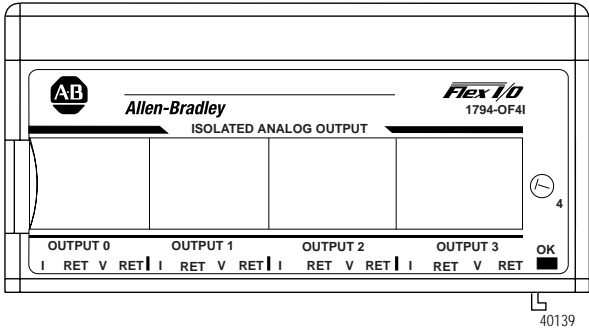
Wiring









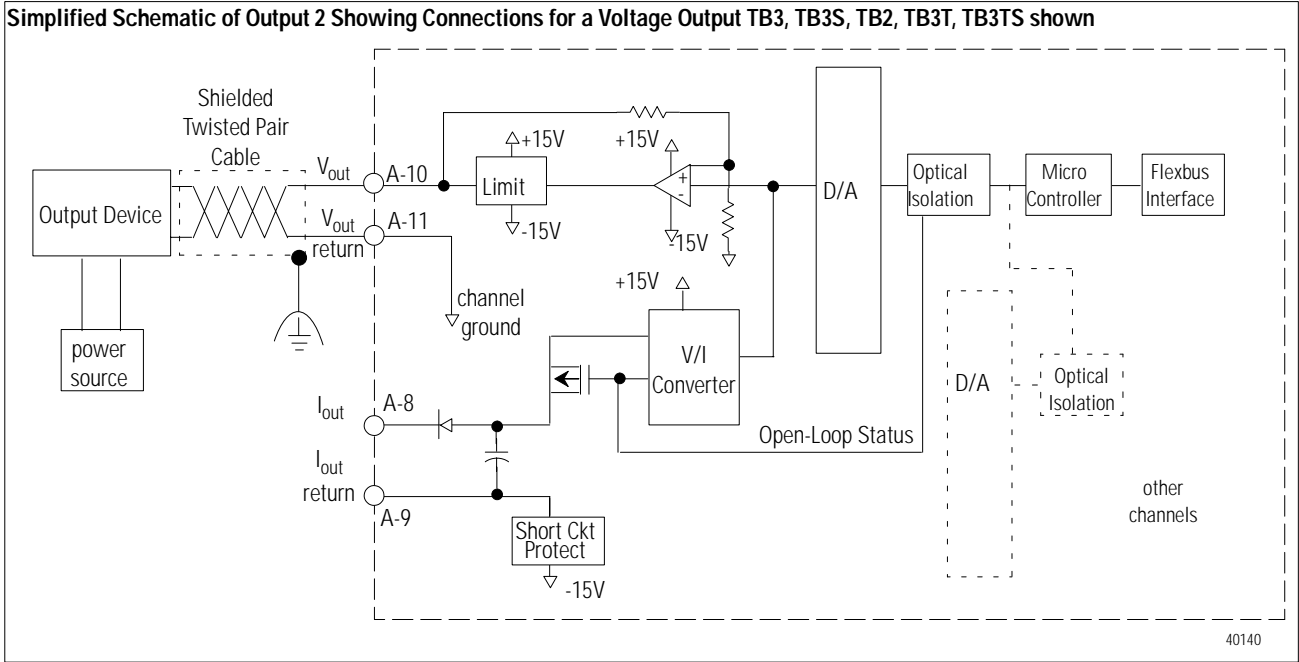
1794-TB3, -TB3S, -TB2, -TB3T, and -TB3TS					1794-TBN
Channel	Signal Type	Label Markings	Terminal	Shield (TB3T/TB3TS)	Terminal
0	Current Input	I0	A-0	C-39	B-0
	Current Return	I0 Ret	A-1		C-1
	Voltage Input	V0	A-2	C-40	B-2
	Voltage Return	V0 Ret	A-3		C-3
1	Current Input	I1	A-4	C-41	B-4
	Current Return	I1 Ret	A-5		C-5
	Voltage Input	V1	A-6	C-42	B-6
	Voltage Return	V1 Ret	A-7		C-7
2	Current Input	I2	A-8	C-43	B-8
	Current Return	I2 Ret	A-9		C-9
	Voltage Input	V2	A-10	C-44	B-10
	Voltage Return	V2 Ret	A-11		C-11
3	Current Input	I3	A-12	C-45	B-12
	Current Return	I3 Ret	A-13		C-13
	Voltage Input	V3	A-14	C-46	B-14
	Voltage Return	V3 Ret	A-15		C-15
24V dc Common	TB2, TB3, TB3S: Terminals 16 thru 33 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31, and 33 are internally connected in the terminal base unit TBN: Terminals 16 and 33 are internally connected in the terminal base unit				
+24V dc Power	TB2 and TBN: Terminals 34 and 51 are internally connected in the terminal base unit TB3, TB3S: Terminals 34 thru 51 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 34, 35, 50, and 51 are internally connected in the terminal base unit				
Chassis Gnd	TB3T, TB3TS: Terminals 39 thru 46 are internally connected to chassis gnd				

Specifications - 1794-IF4I	
Number of Inputs	4 isolated
Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, -TB3TS, and -TBN Terminal Base Units
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable) ±20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable) ±5V (user configurable) 0-5V (user configurable)
Resolution Voltage Current	16 bits - unipolar; 15 bits plus sign - bipolar 0.156mV/cnt unipolar; 0.313mV/cnt bipolar 0.320µA/cnt unipolar; 0.640 µA/cnt bipolar
Input Resistance Voltage Terminal Current Terminal	>10 megohm <100Ω ¹
Isolation Voltage	120V ac continuous (when used with -TB3, -TB3S, -TB2, -TB3T, and -TB3TS) 250V ac continuous (when used with -TBN) Module is factory tested to 2550V dc for 1s between: channel to channel channel to user power channel to system user power to system
Flexbus Current	50mA
Power Dissipation	2.0W maximum @ 31.2V dc
Thermal Dissipation	Maximum 6.9 BTU/hr @ 31.2V dc
Indicators	1 green power/status indicator
Keyswitch Position	3
Data Format	2's complement 2's complement percent binary offset binary
Conversion Type	Sigma Delta
Update Rate	2.5/5.0/7.5ms all channels
Normal Mode Rejection Ratio Voltage or Current Terminal	-3dB @ 12Hz (300Hz conversion rate) -80.0dB @ 50Hz (300Hz conversion rate) -3dB @ 6Hz (150Hz conversion rate) -80.0dB @ 60Hz (150Hz conversion rate)
Common Mode Rejection Ratio	-120dB @ 50/60Hz
Calibration	Factory calibrated
Step Response to 63% Voltage or Current Terminal	1200Hz conversion rate = 0.6ms 600Hz conversion rate = 6.7ms 300Hz conversion rate = 13.4ms 150Hz conversion rate = 26.7ms
Absolute Accuracy ² Voltage Terminal Current Terminal	0.1% Full Scale @ 25°C 0.1% Full Scale @ 25°C
Accuracy Drift w/Temp. Voltage Terminal Current Terminal	0.0028% Full Scale/°C 0.0038% Full Scale/°C
Maximum Overload	30V continuous or 32mA continuous, one channel at a time

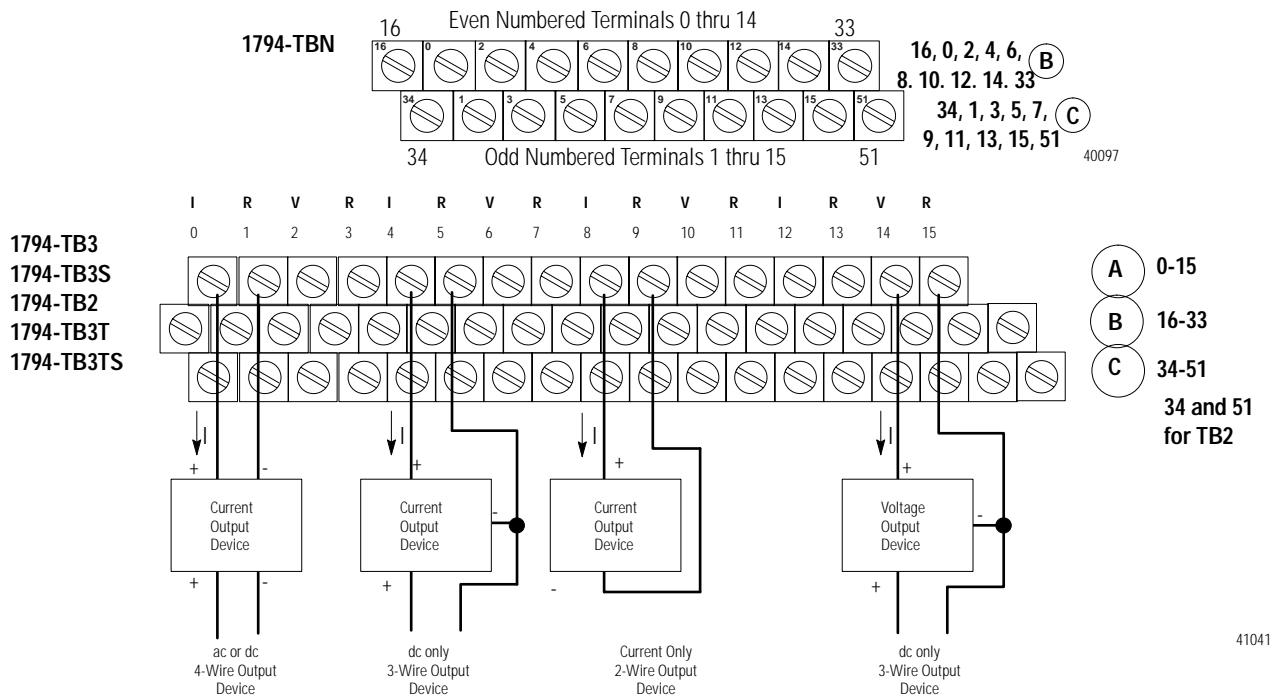
General Specifications	
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 80mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
ConductorsWire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ³
Publications Installation Instructions User Manual	1794-5.38 1794-6.5.8
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 
¹ If 24V dc is removed from the module, input resistance = 10kΩ. ² Includes offset, gain, non-linearity and repeatability error terms. ³ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."	



Recommended Terminal Base	Compatible Terminal Base(s)					
						



Wiring






1794-TB3, -TB3S, -TB2, -TB3T, and -TB3TS					1794-TBN
Channel	Signal Type	Label Markings	Terminal	Shield (TB3T/TB3TS)	Terminal
0	Current Output	I0	A-0	C-39	B-0
	Current Return	I0 Ret	A-1		C-1
	Voltage Output	V0	A-2	C-40	B-2
	Voltage Return	V0 Ret	A-3		C-3
1	Current Output	I1	A-4	C-41	B-4
	Current Return	I1 Ret	A-5		C-5
	Voltage Output	V1	A-6	C-42	B-6
	Voltage Return	V1 Ret	A-7		C-7
2	Current Output	I2	A-8	C-43	B-8
	Current Return	I2 Ret	A-9		C-9
	Voltage Output	V2	A-10	C-44	B-10
	Voltage Return	V2 Ret	A-11		C-11
3	Current Output	I3	A-12	C-45	B-12
	Current Return	I3 Ret	A-13		C-13
	Voltage Output	V3	A-14	C-46	B-14
	Voltage Return	V3 Ret	A-15		C-15
24V dc Common	TB2, TB3, TB3S: Terminals 16 thru 33 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31, and 33 are internally connected in the terminal base unit TBN: Terminals 16 and 33 are internally connected in the terminal base unit				
+24V dc Power	TB2 and TBN: Terminals 34 and 51 are internally connected in the terminal base unit TB3, TB3S: Terminals 34 thru 51 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 34, 35, 50, and 51 are internally connected in the terminal base unit				
Chassis Gnd	TB3T, TB3TS: Terminals 39 thru 46 are internally connected to chassis gnd				

Specifications - 1794-OF4I

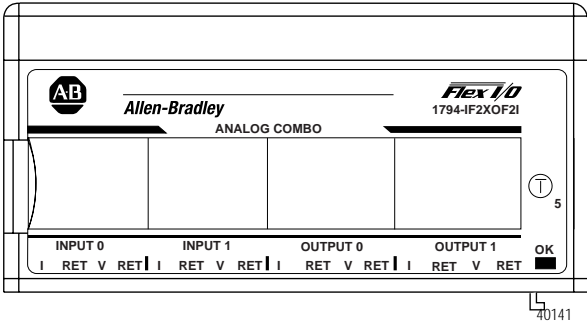
Number of Outputs	4 isolated
Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, -TB3TS, and -TBN Terminal Base Units
Output Current Terminal	0mA output until module is configured 4-20mA (user configurable) 0-20mA (user configurable)
Output Voltage Terminal	0V output until module is configured ±10V (user configurable) 0-10V (user configurable) ±5V (user configurable) 0-5V (user configurable)
Resolution Voltage Current	15 bits plus sign 0.320mV/cnt 0.656µA/cnt
Isolation Voltage	120V ac continuous (when used with -TB3, -TB3S, -TB2, -TB3T and -TB3TS) 250V ac continuous (when used with -TBN) Module is factory tested to 2550V dc for 1s between: channel to channel channel to user power channel to system user power to system
Flexbus Current	50mA
Power Dissipation	4.7W maximum @ 31.2V dc
Thermal Dissipation	Maximum 16 BTU/hr @ 31.2V dc
Indicators	1 green power/status indicator
Keyswitch Position	4
Data Format	2's complement, 2's complement% binary offset binary
Conversion Type	Digital to analog converter
Update Rate	2.5/5.0ms
Calibration	Factory calibrated
Step Response to 63% of FS	<25µs
Absolute Accuracy ¹ Voltage Terminal Current Terminal	0.1% Full Scale @ 25°C 0.1% Full Scale @ 25°C
Accuracy Drift w/Temp. Voltage Terminal Current Terminal	0.0012% Full Scale/°C 0.0025% Full Scale/°C
Current Load on Voltage Output	3mA maximum
Resistive Load on mA Output	0-750Ω







General Specifications

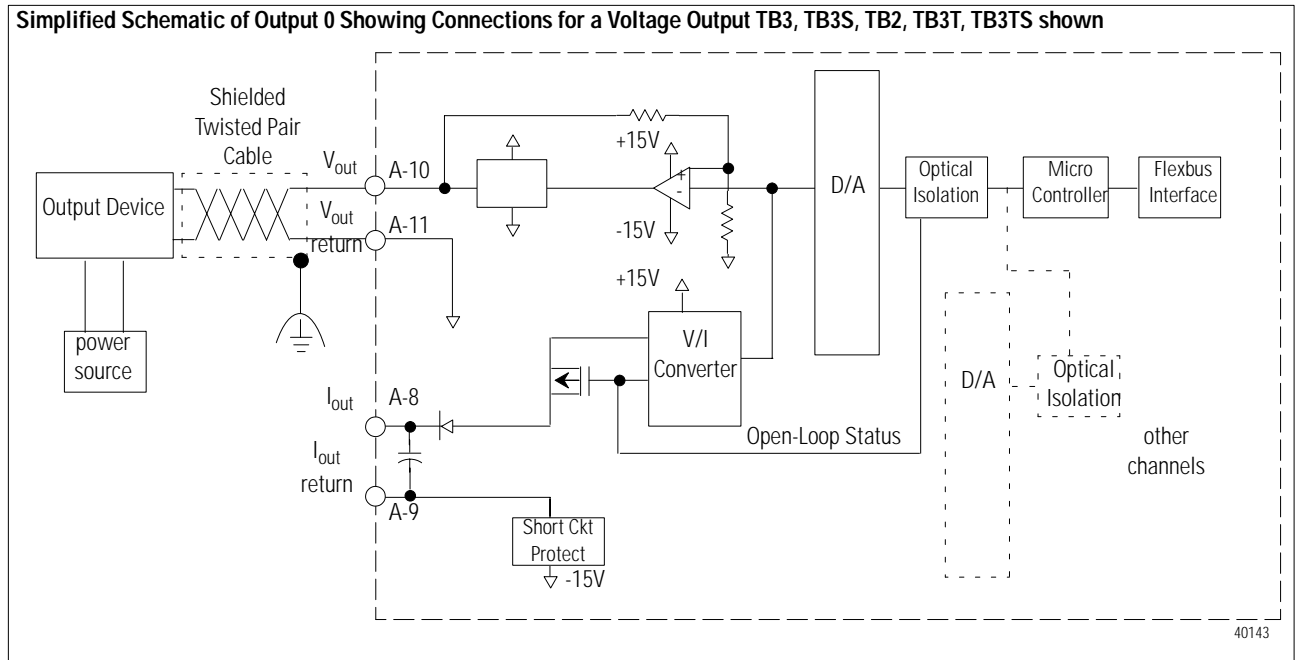
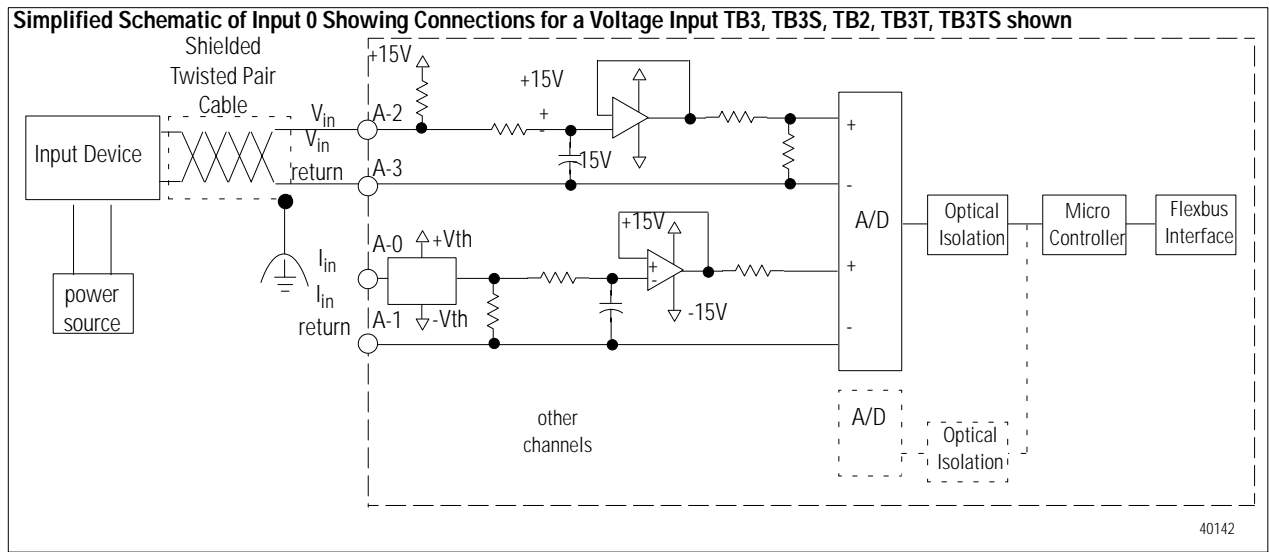
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 210mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
ConductorsWire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ²
Publications Installation Instructions User Manual	1794-5.37 1794-6.5.8
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

1 Includes offset, gain, non-linearity and repeatability error terms.

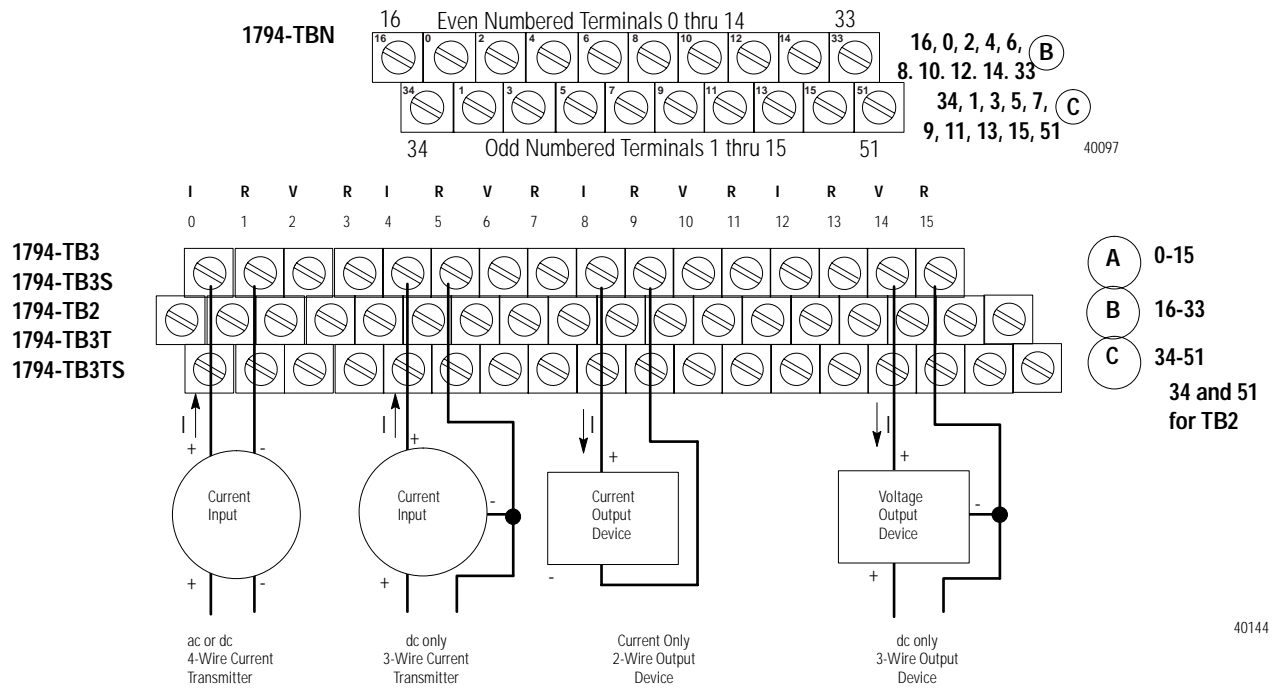
2 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)					
						
* The TB3T provides convenient ground terminations but fewer dc common terminations.						



Wiring



1794-TB3, -TB3S, -TB2, -TB3T, and -TB3TS					1794-TBN
Channel	Signal Type	Label Markings	Terminal	Shield (TB3T/TB3TS)	Terminal
0	Current Input	I0	A-0	C-39	B-0
	Current Return	I0 Ret	A-1		C-1
	Voltage Input	V0	A-2	C-40	B-2
	Voltage Return	V0 Ret	A-3		C-3
1	Current Input	I1	A-4	C-41	B-4
	Current Return	I1 Ret	A-5		C-5
	Voltage Input	V1	A-6	C-42	B-6
	Voltage Return	V1 Ret	A-7		C-7
2	Current Output	I0	A-8	C-43	B-8
	Current Return	I0 Ret	A-9		C-9
	Voltage Output	V0	A-10	C-44	B-10
	Voltage Return	V0 Ret	A-11		C-11
3	Current I Output	I1	A-12	C-45	B-12
	Current Return	I1 Ret	A-13		C-13
	Voltage Output	V0	A-14	C-46	B-14
	Voltage Return	V1 Ret	A-15		C-15
24V dc Common	TB2, TB3, TB3S: Terminals 16 thru 33 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31, and 33 are internally connected in the terminal base unit TBN: Terminals 16 and 33 are internally connected in the terminal base unit				
+24V dc Power	TB2 and TBN: Terminals 34 and 51 are internally connected in the terminal base unit TB3, TB3S: Terminals 34 thru 51 are internally connected in the terminal base unit TB3T, TB3TS: Terminals 34, 35, 50, and 51 are internally connected in the terminal base unit				
Chassis Gnd	TB3T, TB3TS: Terminals 39 thru 46 are internally connected to chassis gnd				

ATTENTION

Only connect either a voltage input or a current input per channel, not both.

Specifications - 1794-IF2XOF21

Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, -TB3TS, and -TBN Terminal Base Unit
Isolation Voltage	120V ac continuous (when used with -TB3, -TB3S, -TB2, -TB3T, and -TB3TS) 250V ac continuous (when used with -TBN) Module is factory tested to 2550V dc for 1s between:channel to channel channel to user power channel to system user power to system
Flexbus Current	50mA
Power Dissipation	3.3W maximum @ 31.2V dc
Thermal Dissipation	Maximum 11 BTU/hr @ 31.2V dc
Keyswitch Position	5
Indicators	1 green power/status indicator
Calibration	Factory calibration




Input Specifications

Number of Inputs	2 isolated
Resolution Voltage Current	16 bits - unipolar; 15 bits plus sign - bipolar 0.156mV/cnt unipolar; 0.313mV/cnt bipolar 0.320μA/cnt unipolar; 0-640μA/cnt bipolar
Data Format	2's complement 2's complement percent binary offset binary
Conversion Type	Sigma delta
Update Rate	2.5/5.0/7.5ms all channels
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable) ±20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable) ±5V (user configurable) 0-5V (user configurable)
Step Response to 63% Voltage or Current Terminal	1200Hz convert rate = 0.6ms 600Hz convert rate = 6.7ms 300Hz convert rate = 13.4ms 150Hz convert rate = 26.7ms
Absolute Accuracy ¹ Voltage Terminal Current Terminal	0.1% Full Scale @ 25°C 0.1% Full Scale @ 25°C
Accuracy Drift w/Temp. Voltage Terminal Current Terminal	0.0028% Full Scale/°C 0.0038% Full Scale/°C
Normal Mode Rejection Ratio Voltage Terminal	
Current Terminal	-3dB @ 12Hz (300Hz conversion rate) -80.0dB @ 50Hz (300Hz conversion rate) -3dB @ 6Hz (150Hz conversion rate) -80.0dB @ 60Hz (150Hz conversion rate)
Input Resistance Voltage Terminal Current Terminal	>10megΩ <100 Ω ²
Maximum Overload	30V continuous or 32mA continuous, one channel at a time

Output Specifications

Number of Outputs	2 isolated
Resolution Voltage Current	15 bits plus sign 0.320mV/cnt 0.656μA/cnt
Data Format	2's complement, 2's complement% binary offset binary
Conversion Type	Digital to analog converter
Update Rate	2.5/5.0ms
Output Current Terminal	0mA output until module is configured 4-20mA (user configurable) 0-20mA (user configurable)
Output Voltage Terminal	0V output until module is configured ±10V (user configurable) 0-10V (user configurable) ±5V (user configurable) 0-5V (user configurable)
Step Response to 63% of FS	<25μs
Absolute Accuracy ³ Voltage Terminal Current Terminal	0.1% Full Scale @ 25°C 0.1% Full Scale @ 25°C
Accuracy Drift w/Temp. Voltage Terminal Current Terminal	0.0012% Full Scale/°C 0.0025% Full Scale/°C
Current Load on Voltage Output	3mA maximum
Resistive Load on mA Output	0 - 750 Ω

General Specifications

External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 150mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (nonoperating)
Shock Operating Non-operating Vibration	30g peak acceleration, 11(±1)ms pulse width 50g peak acceleration, 11(±1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ³
Publications Installation Instructions User Manual	1794-5.39 1794-6.5.8
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Includes offset, gain, non-linearity and repeatability error terms.






² If 24V dc is removed from the module, input resistance = 10kΩ.

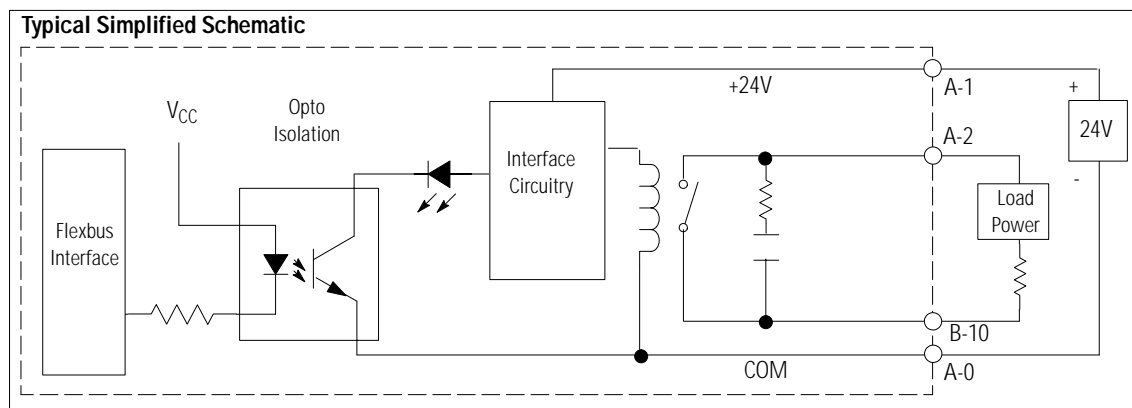
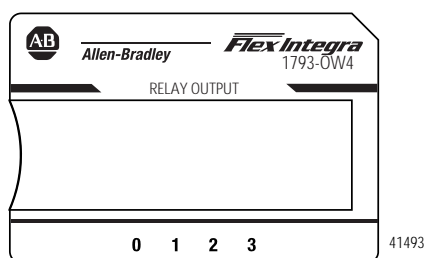
³ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

The following table describes the relay module.

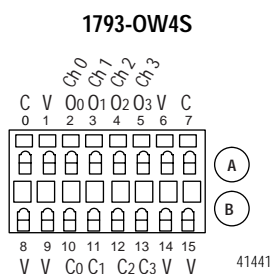
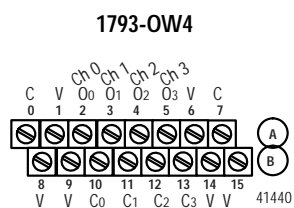
Relay Module	Purpose	See Page
<i>FLEX Integra</i> 1793-OW4 and -OW4S	24V dc, 48V dc, 120V ac, and 240V ac 4 relay sink/source output module - the 1793-OW4 has screw-clamp terminations while 1793-OW4S has spring-clamp terminations	118
<i>FLEX I/O</i> 1794-OW8	24V dc, 48V dc, 120V ac, and 240V ac 8 relay sink/source output module	120

The following table illustrates the recommended terminal base unit(s) for the relay module.

FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
Relay			
Relay Module	1794-OW8		   



Wiring



Where: C = common; V = +24V dc power; O = relay load; Cn = relay common

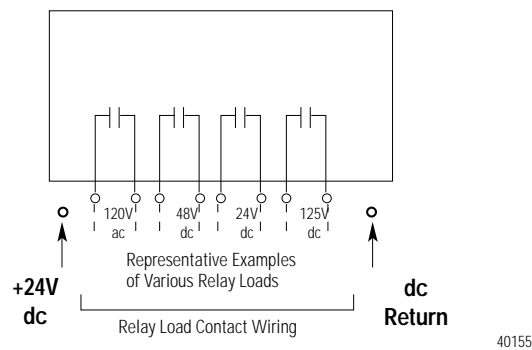
Output Channel	Output Terminal	Common
0	A-2	B-10
1	A-3	B-11
2	A-4	B-12
3	A-5	B-13
+24V dc	Terminals 1, 6, 8, 9, 14 and 15 are internally connected together in the module	
24V dc common	Terminals 0 and 7 are internally connected together in the module.	

ATTENTION



Do not attempt to increase load current or wattage capability beyond the maximum rating by connecting 2 or more outputs in parallel. The slightest variation in relay switching time may cause one relay to momentarily switch the total load current.

Simplified Schematic of Relay Module



Load power can be obtained from a variety of sources, and can range from +5V dc to 240V ac. Make certain that only 24V dc is applied to the module power terminals on the module terminal base.

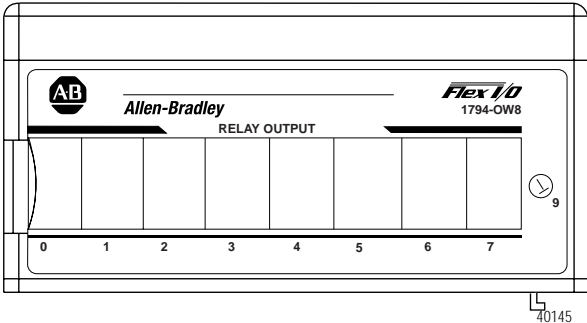
ATTENTION

Apply only +24V dc power to the power terminals on the terminal base unit. Make certain that all relay wiring is properly connected before applying any power to the module.

Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

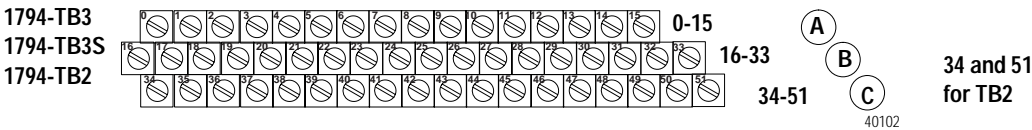
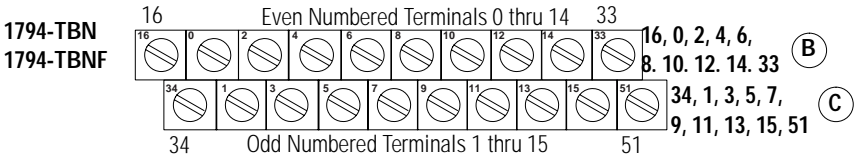
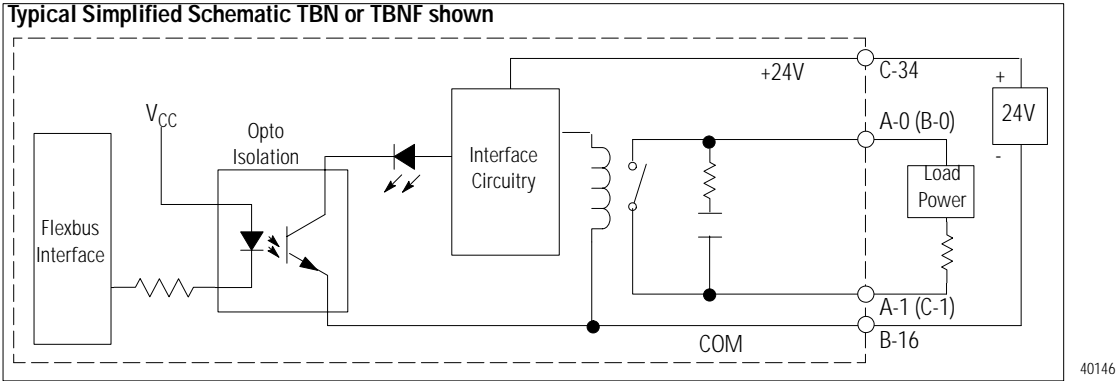
Specifications - 1793-OW4 and -OW4S		
Module Type	Form A relay output 1793-OW4 - screw-cage terminations 1793-OW4S - spring-clamp terminations	
Mounting Location	DIN rail mounting	
Number of Channels	1 group of 4	
Output Range (at rated power)	Resistive 5-30V dc @ 2.0A 48V dc @ 0.5A 125V dc @ 0.25A 125V ac @ 2.0A 240V dc @ 2.0A	Inductive 5-30V dc @ 2.0A; L/R = 7ms 48V dc @ 0.5A; L/R = 7ms 125V dc @ 0.25A; L/R = 7ms 125V ac @ 2.0A; 15A make; PF = cos θ = 0.4 240V ac @ 2.0A; 15A make; PF = cos θ = 0.4
Maximum Power Ratings (steady state)	Resistive 60W @ 30V dc 24W @ 48V dc 31W @ 125V dc 250W @ 125V ac 480W @ 240V ac	Inductive 60VA @ 30V dc 24VA @ 48V dc 31VA @ 125V dc 250VA @ 125V ac 480VA @ 240V ac
Minimum Contact Load	100 μ A @ 100mV dc	
Off-state Leakage Current	1mA @ 240V ac (through a snubber)	
Initial Contact Resistance	30m Ω	
Expected Contact Life	100,000 operations minimum at rated loads	
Switching Frequency	0.3Hz maximum at rated load	
Operate/Release Time	10ms maximum	
Bounce Time	1.2ms (mean)	
Delay Times	Off to On 8ms maximum (from valid output ON signal to relay coil activation) On to Off 26ms (from valid output OFF signal to relay coil deactivation)	
Isolation Voltage	Between any 2 contacts 2550V dc for 1s Customer load to logic 2550V dc for 1s Customer load to 24V dc 2550V dc for 1s Customer 24V dc to logic 850V dc for 1s	

Specifications - 1793-OW4 and -OW4S	
Fuse Recommendations	3.0A, 250V ac slow blow fuse (Littelfuse part number 239003)
Flexbus Current	70mA maximum
Power Dissipation	5.0W @ 31.2V dc
Thermal Dissipation	17.1 BTU/hr @ 31.2V dc
Indicators	4 yellow channel status indicators
General Specifications	
External dc Power Voltage Current	19.2-31.2V dc (5% ac ripple) 125mA maximum
Dimensions (HxWxD)	69mm x 55mm x 80mm (2.72in x 2.17in x 3.15in)
Environmental Conditions	Operational Temperature 0 to +55°C (32 to +131°F) Storage Temperature -40 to +85°C (-40 to +185°F) Relative Humidity 5 to 95% noncondensing Shock Operating Tested to 12g peak acceleration, 11(+1)ms pulse width Nonoperating Tested to 50g peak acceleration, 11(+1)ms pulse width Vibration Tested 2g @ 10-500Hz per IEC68-2-6
ConductorsWire Size	12 gauge (4mm ²) stranded wire 3/64 in (1.2mm) maximum insulation
Category ¹	2
Terminal Screw Torque	4-7 inch-pounds
Publications Installation Instructions	1793-5.7
Agency Certification	
¹ Use this category information for planning conductor routing as described in publication 1770-4.1, "Wiring and Grounding Guidelines for Noise Immunity."	



Recommended Terminal Base	Compatible Terminal Base(s)				

Typical Simplified Schematic TBN or TBNF shown



Output Channel	1794-TB3, -TB3S, -TB2 Output Terminal	Output Channel	1794-TB3, -TB3S, -TB2 Output Terminal	Output Channel	1794-TBN, -TBNF Output Terminal	Output Channel	1794-TBN, -TBNF Output Terminal
0	A-0	4	A-8	0	B-0	4	B-8
	A-1		A-9		C-1		C-9
1	A-2	5	A-10	1	B-2	5	B-10
	A-3		A-11		C-3		C-11
2	A-4	6	A-12	2	B-4	6	B-12
	A-5		A-13		C-5		C-13
3	A-6	7	A-14	3	B-6	7	B-14
	A-7		A-15		C-7		C-15

A = output terminals
B = dc return terminals
C = power terminals (C-34 thru 51 for TB3, TB3S) (C-34 and C-51 for TB2)

B = even numbered output terminals 0-14, 24V dc return terminals B-16 and B-33
C = odd numbered output terminals 1-15; 24V dc power terminals C-34 and C-51

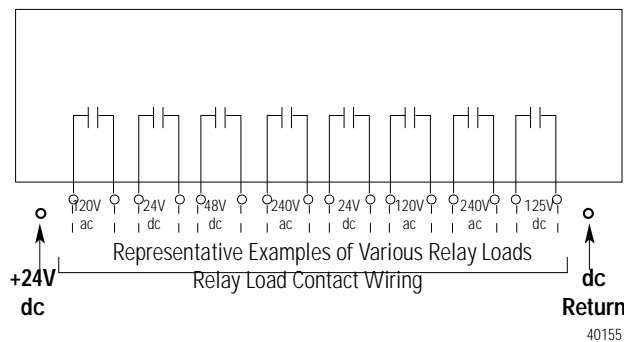
ATTENTION

Do not attempt to increase load current or wattage capability beyond the maximum rating by connecting 2 or more outputs in parallel. The slightest variation in relay switching time may cause one relay to momentarily switch the total load current.

Apply only +24V dc power to the power terminals on the terminal base unit. Make certain that all relay wiring is properly connected before applying any power to the module.

Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

Simplified Schematic of Relay Module






Load power can be obtained from a variety of sources, and can range from +5V dc to 240V ac. Make certain that only 24V dc is applied to the module power terminals on the module terminal base

Specifications - 1794-OW8

Outputs per Module	8 Form A isolated (normally open) electromechanical relays
Module Location	Cat. No. 1794-TBNF, -TB3, -TB3S, -TB2 or -TBN Terminal Base Unit
Off-State Leakage Current (max at 240V ac)	1mA thru snubber circuit
Output Voltage Range (load dependent)	5-30V dc @ 2.0A resistive 48V dc @ 0.5A resistive 125V dc @ 0.25A resistive 125V ac @ 2.0A resistive 240V ac @ 2.0A resistive
Output Current Rating (at rated power)	Resistive 2A @ 5-30V dc 0.5A @ 48V dc 0.25A @ 125V dc 2A @ 125V ac 2A @ 240V ac Inductive 2.0A steady state @ 5-30V dc, L/R = 7ms 0.5A steady state @ 48V dc, L/R = 7ms 0.25A steady state @ 125V dc, L/R = 7ms 2.0A steady state, 15A make @ 125V ac, PF = cos θ = 0.4 2.0A steady state, 15A make @ 240V ac, PF = cos θ = 0.4
Power Rating (steady state)	250W max. for 125V ac resistive output 480W max. for 240V ac resistive output 60W max. for 30V dc resistive output 24W max. for 48V dc resistive output 31W max. for 125V dc resistive output 250VA max. for 125V ac inductive output 480VA max. for 240V ac inductive output 60VA max. for 30V dc inductive output 24VA max. for 48V dc inductive output 31VA max. for 125V dc inductive output

Isolation Voltage	Between any 2 sets of contacts: 2550V dc for 1s Customer load to logic: 2550V dc for 1s Customer load to 24V dc supply: 2550V dc for 1s Customer 24V dc supply to logic: 850V dc for 1s
Output Signal Delay	OFF to ON: 8ms maximum (time from valid output on signal to relay energization by module) ON to OFF: 26ms maximum (time from valid output off signal to relay deenergization by module)
Flexbus Current (max)	69mA @ 5V dc
Power Dissipation	Maximum 5.5W
Thermal Dissipation	Maximum 18.8 BTU/hr
Indicators (field side indication, logic driven)	8 yellow status indicators
Keyswitch position	9
Initial Contact Resistance	30m Ω
Switching Frequency	1 operation/3s (0.3Hz at rated load) max
Operate/Release Time	Maximum 10ms
Bounce Time	1.2ms (mean)
Minimum Contact Load	100 μ A at 100mV dc
Expected Life of Electrical Contacts	Minimum 100,000 operations @ rated loads
Fusing ¹	Use a 1794-TBNF with a 3.0A Littelfuse 239003
Max Inrush Current	15A

General Specifications














External dc Power	24V dc nominal
Supply Voltage	19.2 to 31.2V dc (includes 5% ac ripple)
Voltage Range	125mA maximum
Supply Current	
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	12g peak acceleration, 11(\pm 1)ms pulse width
Operating	50g peak acceleration, 11(\pm 1)ms pulse width
Non-operating	Tested 2g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	1 ²
Publication	
Installation Instructions	1794-5.19
Agency Certification	Meets URLR150 and C300; Meets IEC 1131 AC-15 Utilization Category
	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

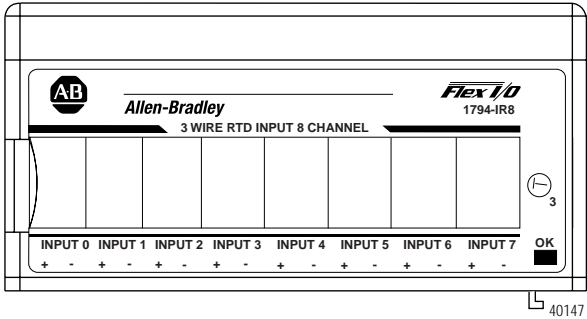
- 1 Module outputs are not fused. If external fusing is desired, you must provide external fusing.
- 2 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."






Use the following table to determine which specialty module will meet your application needs.

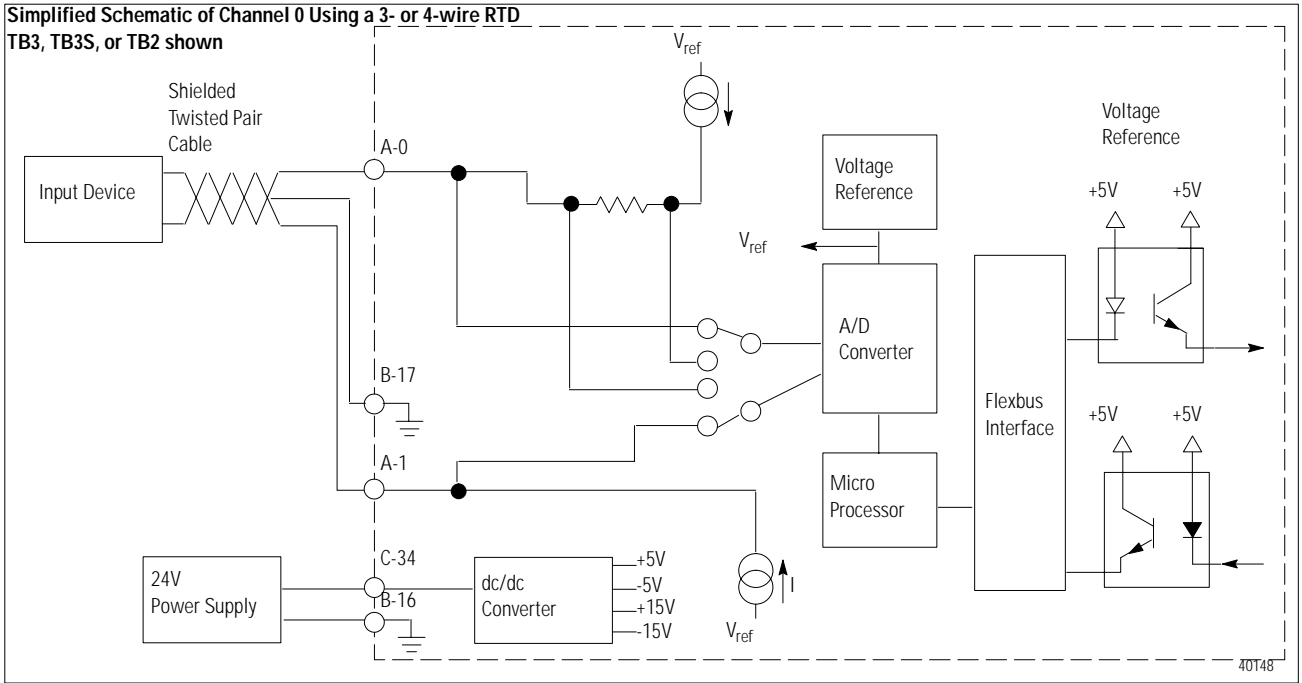
Specialty Module	Purpose	See Page
1794-IR8	24V dc 8 input RTD module	123
1794-IRT8	24V dc thermocouple/RTD module	126
1794-IT8	24V dc 8 input thermocouple/mV module	129
1203-FM1	SCANport module	132

The following table illustrates the recommended terminal base unit(s) for each specialty module.

FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
Specialty			
RTD Input Module	1794-IR8		   
Thermocouple/RTD Input Module	1794-IRT8		
Thermocouple/mV Input Module	1794-IT8	 *	    You can use a TB2, TB3, or TB3S for mV inputs only.
SCANport Module	1203-FM1		None
* You can use a -TB3, -TB3S, or -TB2 for mV inputs only.			



Recommended Terminal Base	Compatible Terminal Base(s)
	   



Wiring

1. Connect the individual high and low signal wiring to numbered terminals on the **0-15** row (**A**) on the terminal base unit as indicated in the table below.
2. Connect 24V dc common to terminal 16 on row (**B**).
3. Connect individual channel signal returns to the associated terminal on row (**B**) as shown in the table below.

ATTENTION

Use the following Belden cables for connecting the RTD to the terminal base unit.



RTD Type	Length of Run/Humidity Level	Belden Cable Number
2-wire	Not applicable	9501
3-wire	Less than 100ft (30.5m) with normal humidity	9533
	Over 100ft (30.5m) or high humidity ¹	83503

¹ Greater than 55% for more than 8 hours

4. Connect individual channel shield returns to the associated terminal on row (**B**) for 1794-TB3 or row (**C**) for the 1794-TB3T as shown in the table below.
5. Connect +24V dc to terminal 34 on the **34-51** row (**C**).

ATTENTION



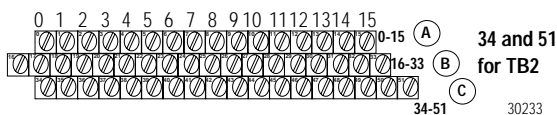
To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 33ft (10m) for dc power cabling.

Do not daisy chain power or ground from the RTD terminal base unit **to any ac or dc digital module terminal base units**.

6. If daisy-chaining 24V dc common, connect jumper from terminal 33 to terminal 16 on the next terminal base unit.
7. If daisy-chaining +24V dc, connect jumper from terminal 51 to terminal 34 on the next terminal base unit.
8. Connect the shield to functional earth ground as near as possible to the module.

ATTENTION

Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

1794-TB3, -TB3S, -TB2, -TB3T, or -TB3TS

RTD Channel	1794-TB3, -TB3S, -TB2 Terminal Base Unit			
	High Signal Terminal	Low Signal Terminal	Signal Return ¹	Shield Return
0	A-0	A-1	B-17	B-18
1	A-2	A-3	B-19	B-20
2	A-4	A-5	B-21	B-22
3	A-6	A-7	B-23	B-24
4	A-8	A-9	B-25	B-26
5	A-10	A-11	B-27	B-28
6	A-12	A-13	B-29	B-30
7	A-14	A-15	B-31	B-32

24V dc Common 16 thru 33

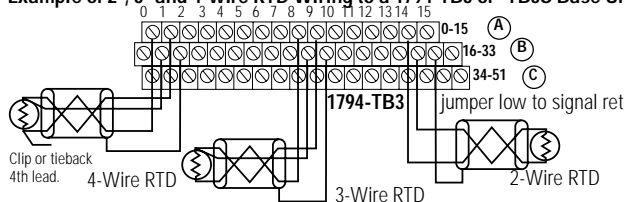
+24V dc power 34 thru 51 (34 and 51 for TB2)

¹ When using a 2-wire RTD, jumper the signal return to the low signal terminal.

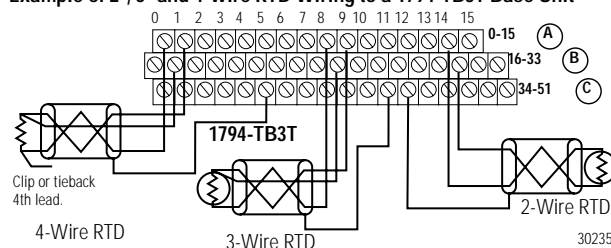
RTD Channel	1794-TB3T or -TB3TS Terminal Base Unit			
	High Signal Terminal	Low Signal Terminal	Signal Return	Shield Return ¹
0	A-0	A-1	B-17	C-39
1	A-2	A-3	B-19	C-40
2	A-4	A-5	B-21	C-41
3	A-6	A-7	B-23	C-42
4	A-8	A-9	B-25	C-43
5	A-10	A-11	B-27	C-44
6	A-12	A-13	B-29	C-45
7	A-14	A-15	B-31	C-46

24V dc Common 16, 17, 19, 21, 23, 25, 27, 29, 31 and 33

+24V dc power 34, 35, 50, and 51

¹ Terminals 39 to 46 are chassis ground.**Example of 2-, 3- and 4-wire RTD Wiring to a 1794-TB3 or -TB3S Base Unit****ATTENTION:** Keep exposed area of inner conductor as short as possible. 30234

For pure resistance measurements, tie each side of resistor to "high" and "low" terminals. Then jumper the "low" (odd numbered) terminal to signal return (com).

Example of 2-, 3- and 4-wire RTD Wiring to a 1794-TB3T Base Unit**ATTENTION:** Keep exposed area of inner conductor as short as possible.

Temp and resistance data is returned with an implied decimal point. For example a temp data of 1779 is 177.9°. Resistance data of 2034 is 203.4Ω.

Data Type

Word	Description		
Write word 0	Module Data Type		
Bit	01	00	
	0	0	°C (default) or resistance (in Ω)
	0	1	°F
	1	0	Bipolar counts scaled between -32768 and +32767
	1	1	Unipolar counts scaled between 0 and 65535

RTD Type

Word	Description		
Write word 1	RTD Type - Range		
Bit	03	02	01 00 Channel 0
	0	0	0 0 Resistance (default)
	0	0	0 1 No sensor connected - do not scan
	0	0	1 0 100W Pt ∞ = 0.00385 Euro (-200 to +870°C)
	0	0	1 1 100W Pt ∞ = 0.003916 U.S. (-200 to +630°C)
	0	1	0 0 200W Pt ∞ = 0.00385 Euro (-200 to +630°C)
	0	1	0 1 500W Pt ∞ = 0.00385 Euro (-200 to +630°C)
	0	1	1 0 Reserved
	0	1	1 1 10Ω Copper (-200 to +260°C)
	1	0	0 0 120Ω Nickel (-60 to +250°C)
	1	0	0 1 100Ω Nickel (-60 to +250°C)
	1	0	1 0 200Ω Nickel (-60 to +250°C)
	1	0	1 1 500Ω Nickel (-60 to +250°C)
	1	1	0 0 Reserved
Bit	07	06	05 04 Channel 1 - see bits 00-03, word 1
	11	10	09 08 Channel 2 - see bits 00-03, word 1
	15	14	13 12 Channel 3 - see bits 00-03, word 1
Write Word 2	Bit	03	02 01 00 Channel 4 - see bits 00-03, word 1
		07	06 05 04 Channel 5 - see bits 00-03, word 1
		11	10 09 08 Channel 6 - see bits 00-03, word 1
		15	14 13 12 Channel 7 - see bits 00-03, word 1




Specifications - 1794-IR8

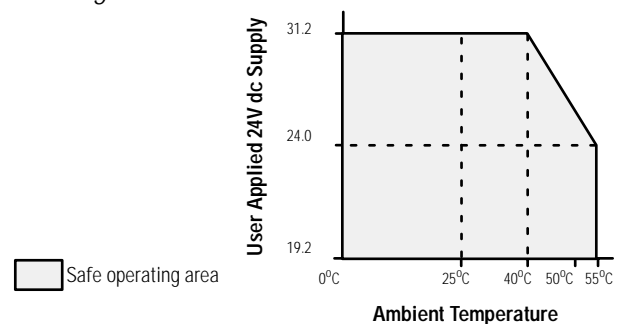
Number of Inputs	8 Channels
Module Location	Cat. No. 1794-TB3, -TB3S, -TB2, -TB3T, or -TB3TS Terminal Base Unit
Signal Input Range	1 to 433 Ω
Sensors Supported	Resistance: 100 Ω Pt μ = 0.00385 Euro (-200 to +870°C) 100 Ω Pt μ = 0.003916 U.S. (-200 to +630°C) 200 Ω Pt μ = 0.00385 Euro (-200 to +630°C) 500 Ω Pt μ = 0.00385 Euro (-200 to +630°C) 100 Ω Nickel μ = 0.00618 (-60 to +250°C) 120 Ω Nickel μ = 0.00672 (-60 to +250°C) 200 Ω Nickel μ = 0.00618 (-60 to +250°C) 500 Ω Nickel μ = 0.00618 (-60 to +250°C) 10 Ω Copper ∞ = 0.00427 (-200 to +260°C)
Resolution	16 bits across 435 Ω
Data Format	Left justified 16-bit 2's complement or offset binary
Normal Mode Noise Rejection	60db @ 60Hz for A/D filter cutoff @ 15Hz
Accuracy without Calibration (low humidity)	Normal mode: 0.05% Full Scale (maximum) Enhanced Mode: 0.01% Full Scale (typical)
Common Mode Rejection	-120db @ 60Hz; -100db @ 50Hz with A/D filter cutoff @ 10Hz
Common Mode Voltage	0V between channels (common return)
System Throughput Normal mode:	Programmable from 28ms/channel to 325ms/channel 325ms (1 channel scanned) 2.6s (8 channels scanned)
Enhanced mode:	Programmable from 56ms/channel to 650ms/channel 650ms (1 channel scanned) 2.925s (8 channels scanned)
Settling Time to 100% of Final Value	Available at system throughput rate
Open RTD Detection	Out of range reading (upscale)
Open Wire Detection Time	Available at system throughput rate
Overvoltage Capability	35V dc, 25V ac continuous @ 25°C 250V peak transient
Channel Bandwidth	dc to 2.62Hz (-3db)
RFI Immunity	Error of less than 1% of range at 10V/M 27 to 1000MHz
Input Offset Drift with Temperature	1.5 m Ω /°C maximum

Specifications - 1794-IR8 (continued)

Gain Drift with Temperature	Normal mode: 20 ppm/°C maximum Enhanced mode: 10 ppm/°C maximum
RTD Excitation Current	718.39 μ A
Indicators	1 red/green status indicator
Flexbus Current	20mA
Power Dissipation	3W maximum @ 31.2V dc
Thermal Dissipation	Maximum 10.2 BTU/hr @ 31.2V dc
Keyswitch Position	3
Cable Requirements	2-wire Belden 9501 3-wire, less than 100ft (30.5m) with normal humidity- Belden 9533 3-wire, greater than 100ft (30.5m) or high humidity (>55% for >8 hrs)- Belden 83503

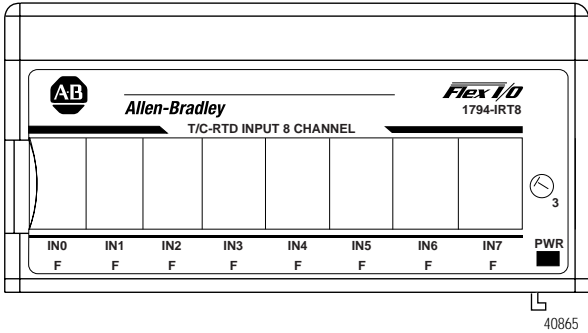
General Specifications



External dc Power Supply Voltage Range	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 19.2V dc for ambient temperatures < 55°C 24V dc for ambient temperatures < 55°C 31.2V dc for ambient temperatures < 40°C See derating curve.
Supply Current	140mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) See derating curve. -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating) 30g peak acceleration, 11(\pm 1)ms pulse width 50g peak acceleration, 11(\pm 1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Shock Operating Non-operating Vibration	
Publications Installation Instructions User Manual	1794-5.22 1794-6.5.4
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified  Class I Zone 2 Group IIC certified

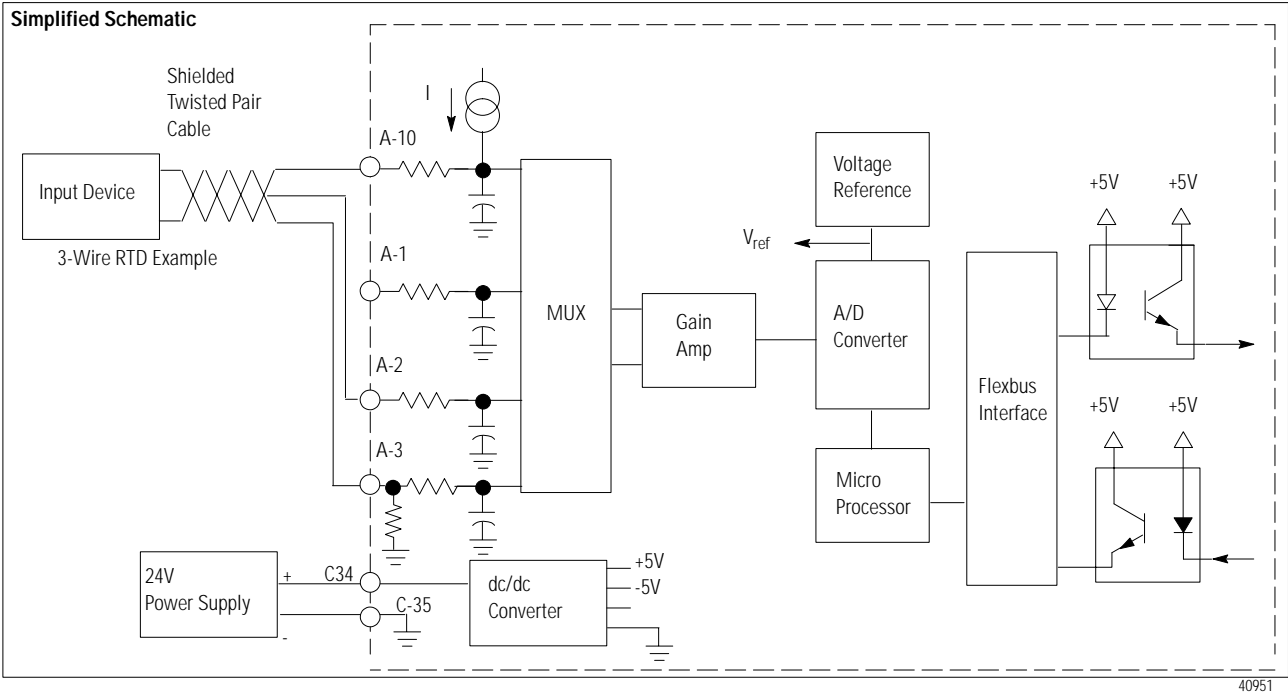
Derating Curve

The area within the curve represents the safe operating range for the module under various conditions of user supplied 24V dc supply voltages and ambient temperatures.

40156

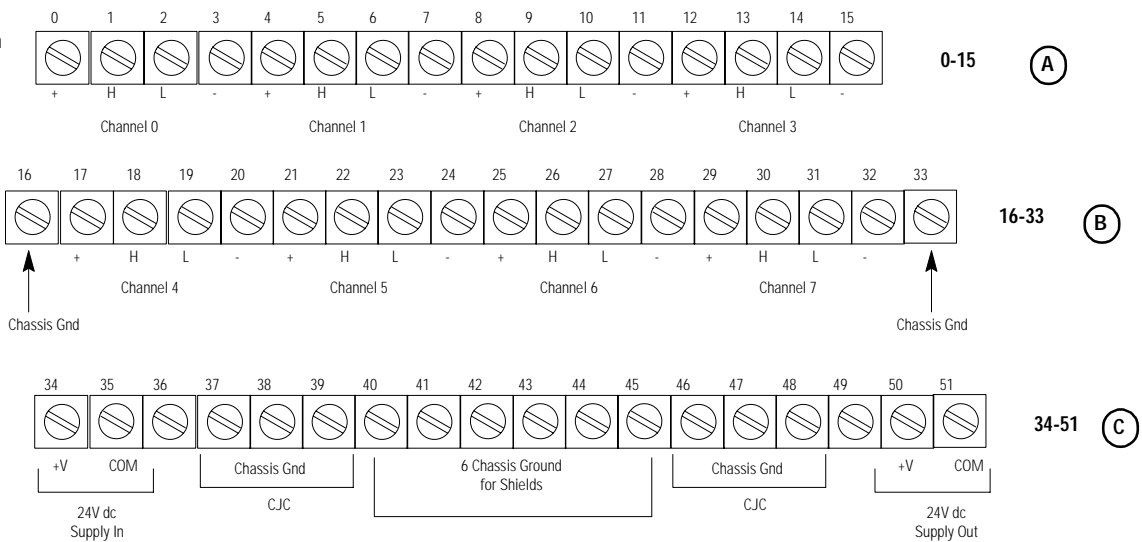


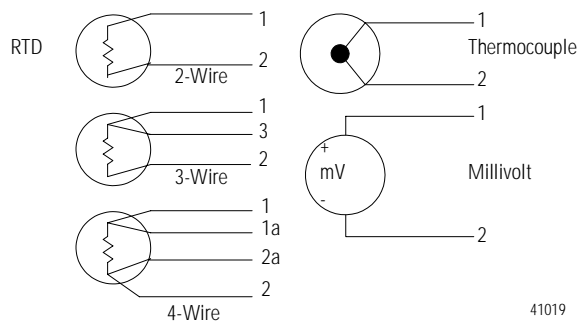
Recommended Terminal Base	Compatible Terminal Base(s)
	



Wiring.

Connections for 1794-TB3G shown





Type of Input	Connect the following				
	H	L	+	-	Shield ¹
RTD - 2-wire			1	2	
RTD - 3-wire		3	1	2	
RTD - 4-wire	1a	2a	1	2	
Thermocouple		1		2	
Millivolt		1		2	

¹ Terminals 37, 38, and 39 and 46, 47, and 48 are for cold junction compensation (with 38 and 47 chassis GND).

RTD or Thermocouple Channel	1794-TB3G and -TB3GS Terminal Base Units			
	High Signal Terminal (H)	Low Signal Terminal (L)	RTD Source Current (+)	Signal Return ¹ (-)
0	A-1	A-2	A-0	A-3
1	A-5	A-6	A-4	A-7
2	A-9	A-10	A-8	A-11
3	A-13	A-14	A-12	A-15
4	B-18	B-19	B-17	B-20
5	B-22	B-23	B-21	B-24
6	B-26	B-27	B-25	B-28
7	B-30	B-31	B-29	B-32
+24V dc Power	34 and 50			
24V dc Common	35 and 51			

¹ Terminals 37, 38, and 39 and 46, 47, and 48 are for cold junction compensation (with 38 and 47 chassis GND).
² Terminals 16, 33, and 40 thru 45 are chassis ground.

ATTENTION

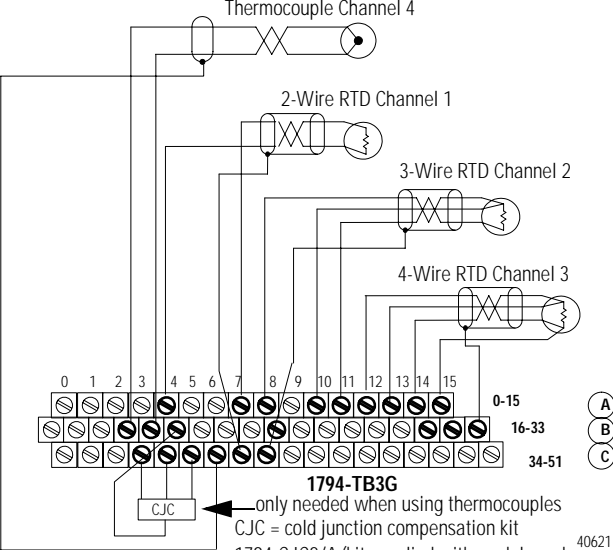


To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 10m (33ft) for dc power cabling.

Do not daisy chain power or ground from this terminal base unit **to any ac or dc digital module terminal base units.**

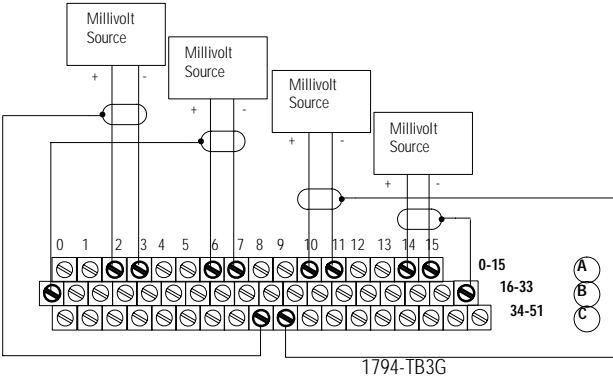
Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

Example of 2-, 3-, and 4-wire RTD and Thermocouple Wiring to a 1794-TB3G Terminal Base Unit



Attention: Keep exposed area of inner conductor as short as possible.
Note: Module cannot be configured as shown. This is just an example of different input connections.
This is a non-isolated module. You may need to take extra precautions like tying the 24V dc common to the earth ground.

Example of Millivolt Wiring to a 1794-TB3G Terminal Base Unit



ATTENTION: Keep exposed area of inner conductor as short as possible.

Data Type

Bit	11	10	09	08	Data type for channels 0-7
0	0	0	0	0	°C or resistance (in Ω)
0	0	0	0	1	°F
0	0	1	0	0	°K
0	0	1	1	1	-32767 to +32767
0	1	0	0	0	0 to 65535

0101 through 1111 not used
Module defaults to -4000 to 10000 in millivolt mode, and 0 to 5000 in ohms mode.
Note: For millivolts there are two implied decimals. For degrees and ohms there is one implied decimal.




Specifications - 1794-IRT8

Number of Inputs	8 Channels (2 groups of 4)
Module Location	Cat. No. 1794-TB3G, -TB3GS Terminal Base Unit
Nominal Input Ranges	-40 to +100mV dc for thermocouples 0 to 325mV dc for RTDs 0 to 500 Ω for resistance range
Supported RTD Types	Resistance: 100 Ω Pt ∞ = 0.00385 Euro (-200 to +870°C) 100 Ω Pt ∞ = 0.003916 U.S. (-200 to +630°C) 200 Ω Pt ∞ = 0.00385 Euro (-200 to +400°C) 200 Ω Pt ∞ = 0.003916 U.S. (-200 to +400°C) 100 Ω Nickel ∞ = 0.00618 (-60 to +250°C) 120 Ω Nickel ∞ = 0.00672 (-80 to +320°C) 200 Ω Nickel ∞ = 0.00618 (-60 to +200°C) 10 Ω Copper ∞ = 0.00427 (-200 to +260°C)
Supported Thermocouple Types	Type B: 300 to 1800°C (572 to 3272°F) Type E: -270 to 1000°C (-454 to 1832°F) Type J: -210 to 1200°C (-346 to 2192°F) Type K: -270 to 1372°C (-454 to 2502°F) Type TXK/XX (L): -200 to 800°C (-328 to 1472°F) Type N: -270 to 1300°C (-454 to 2372°F) Type R: -50 to 1768°C (-58 to 3214°F) Type S: -50 to 1768°C (-58 to 3214°F) Type T: -270 to 400°C (-454 to 752°F)
Resolution	14 bits
Data Format	°C (implied decimal point XXX.X) °F (implied decimal point XXX.X) °K (implied decimal point XXX.X) -32767 to +32767 0-65535 0-5000 (Ω mode) (implied decimal point XXX.X) -4000 to +10000 (millivolt mode) (implied decimal point XXX.XX)
Accuracy vs. Filter Cutoff	0.05% of full range in millivolt mode with filtering selected Hardware only = 0.10% of full range in millivolt mode
Common Mode Rejection	-80db @ 5V peak-to-peak 50-60Hz
Common Mode Input Range	\pm 4V minimum
Isolation Voltage	1500V ac (rms) or 2550V dc for 1.0s between customer and system
System Throughput - add 0.5ms if filtering is selected	For maximum throughput short circuit all unused channels. 5.4ms - millivolt 7.05ms - Ω - 2-wire RTD 9.1ms - Ω - 3-wire RTD 9.2ms - Ω - 4-wire RTD 7.3ms - 2-wire RTD (°F) 9.4ms - 4-wire RTD (°F) 7.7ms - 2-wire RTD (°C), (°K) 9.8ms - 4-wire RTD (°C), (°K) 9.35ms - 3-wire RTD (°F) 9.75ms - 3-wire RTD (°C), (°K) 6.65ms - Thermocouples (°F) 7.0ms - Thermocouples (°C), (°K)
Open Circuit Detection	Defaults to maximum value

Specifications - 1794-IRT8 (continued)

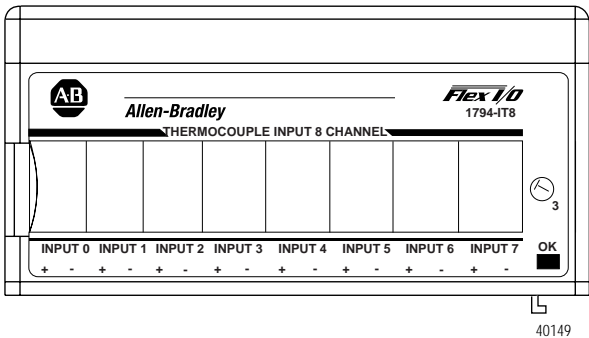
Excitation Current	630 μ A
Open Input Detection Time	0 to 3.8s for revision D or earlier Immediate detection (maximum 1 scan) for revision E or later
Overvoltage Capability	7V dc continuous @ 25°C
RFI Immunity	Error of less than 1% of range at 10V/M 27 to 1000MHz
Overall Drift with Temperature	150ppm/°C of span (maximum)
Cold Junction Compensation Range	0 to 70°C
Cold Junction Compensator	A-B Cold Junction Compensator Kit, 1794-CJC2 (kit supplied with the module and contains 2 compensators)
Indicators	1 green power status indicator
Flexbus Current	40mA
Power Dissipation	3W maximum @ 31.2V dc
Thermal Dissipation	Maximum 10.2 BTU/hr @ 31.2V dc
Keypad Position	3






General Specifications

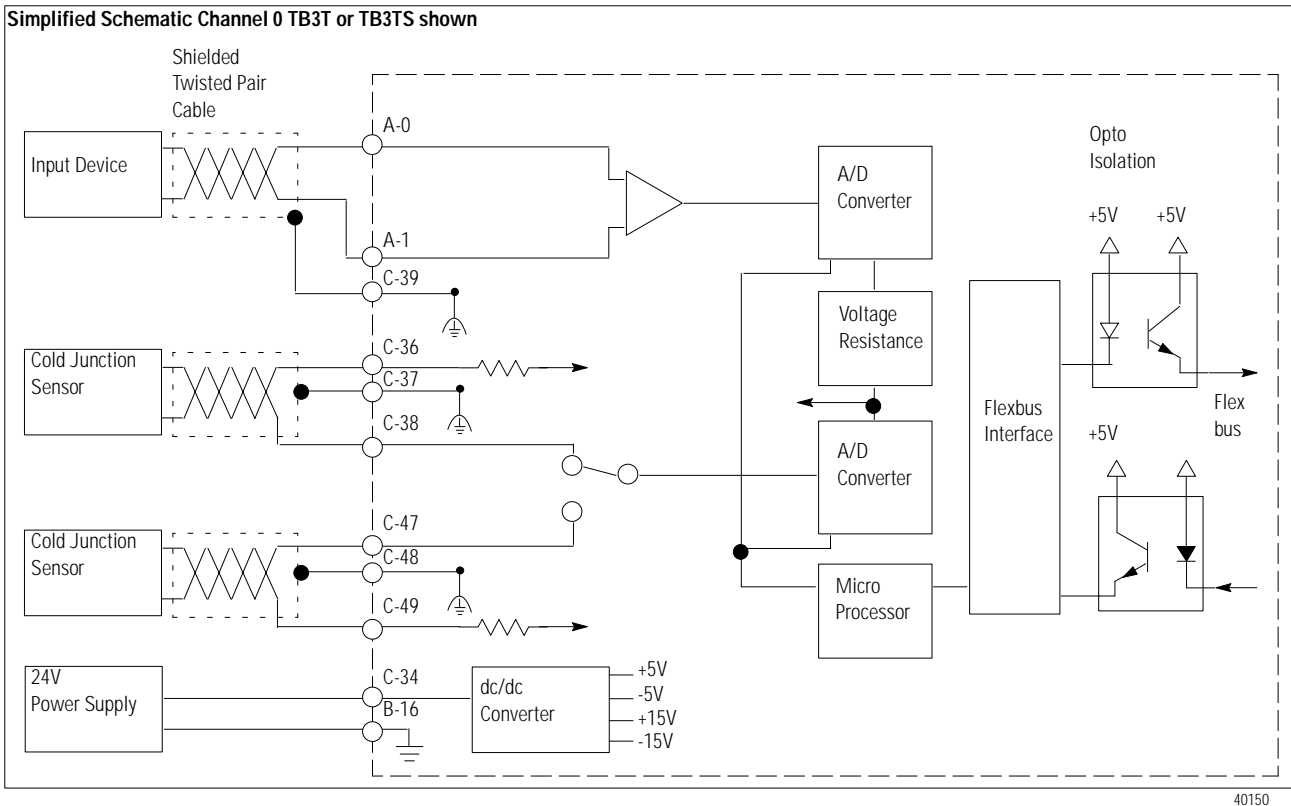
External dc Power Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 85mA @ 24V dc
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating) 30g peak acceleration, 11(\pm 1)ms pulse width 50g peak acceleration, 11(\pm 1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Shock Operating Vibration Non-operating	
Conductors Thermocouple mV Category	Use appropriate shielded thermocouple wire ¹ Belden 8761 2 ²
Publications Installation Instructions User Manual	1794-5.50 1794-6.5.12
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

1 Refer to thermocouple manufacturer for proper thermocouple extension.

2 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Wiring and Grounding Guidelines for Noise Immunity."



Recommended Terminal Base	Compatible Terminal Base(s)
	   
You can use a TB2, TB3, or TB3S for mV inputs only.	



Wiring

1. Connect the individual high and low signal wiring to numbered terminals on the **0-15** row **(A)** on the terminal base unit as indicated in the table below.
2. Connect 24V dc common to terminal 16 on row **(B)**.
3. Connect individual channel shield returns to the associated terminal on row **(B)** for 1794-TB3 or row **(C)** for the 1794-TB3T as shown in the table below.
4. Connect +24V dc to terminal 34 on the **34-51** row **(C)**.

ATTENTION



To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 10m (33ft) for dc power cabling.

Do not daisy chain power or ground from the RTD terminal base unit to any ac or dc digital module terminal base units.

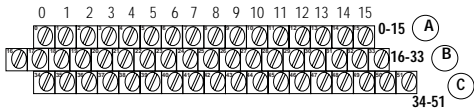
5. If daisy-chaining 24V dc common, connect jumper from terminal 33 to terminal 16 on the next terminal base unit.
6. If daisy-chaining +24V dc, connect jumper from terminal 51 to terminal 34 on the next terminal base unit.
7. Connect the shield to functional earth ground as near as possible to the module.

ATTENTION



Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

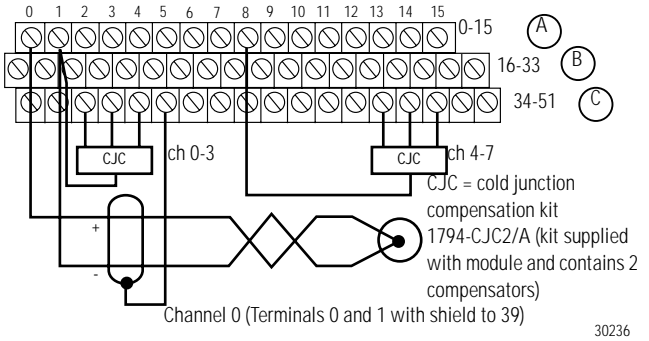
1794-TB3, -TB3S, -TB2, -TB3T, or -TB3TS



mV Mode Channel	1794-TB3, -TB3S, -TB2 Terminal Base Unit			
	High Signal Term. (+)	Low Signal Term. (-)	Shield Return	Not Used
0	A-0	A-1	B-17	B-18
1	A-2	A-3	B-19	B-20
2	A-4	A-5	B-21	B-22
3	A-6	A-7	B-23	B-24
4	A-8	A-9	B-25	B-26
5	A-10	A-11	B-27	B-28
6	A-12	A-13	B-29	B-30
7	A-14	A-15	B-31	B-32
24V dc Common	16 thru 33			
+24V dc power	34 thru 51 (34 and 51 for TB2)			

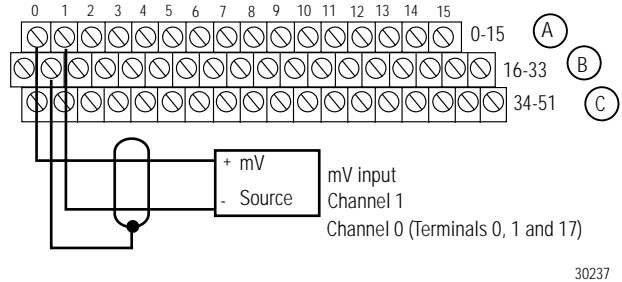
Thermo-couple Channel	1794-TB3T, -TB3TS Terminal Base Unit			
	High Signal Term. (+)	Low Signal Term. (-)	Not Used	Shield Return
0	A-0	A-1	B-17	B-39
1	A-2	A-3	B-19	B-40
2	A-4	A-5	B-21	B-41
3	A-6	A-7	B-23	B-42
4	A-8	A-9	B-25	B-43
5	A-10	A-11	B-27	B-44
6	A-12	A-13	B-29	B-45
7	A-14	A-15	B-31	B-46
24V dc Common	16, 17, 19, 21, 23, 25, 27, 29, 31 and 33			
+24V dc power	34, 35, 50 and 51			

Example of Thermocouple Wiring to 1794-TB3T Base Unit



This is a non-isolated module. You may need to take extra precautions when using grounded thermocouples, like tying the 24V dc common to the earth ground.

Example of mV Input Wiring to 1794-TB3 or -TB3S Base Unit



Data Type




Word	Description		
Write Word 0	Module Data Type		
	Bit	01	00
	Definition		
		0	0
		0	1
		1	0
		1	1
	Definition		

1 For millivolts there are two implied decimals. For degrees and ohms there is one implied decimal.

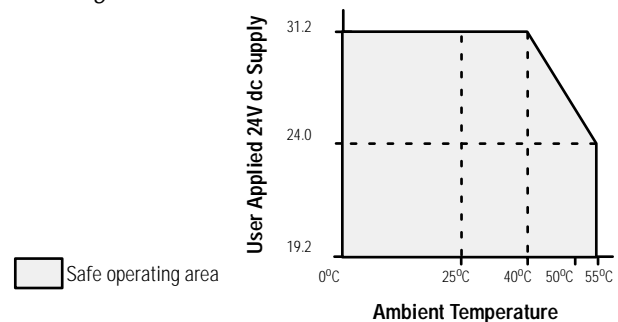
Specifications - 1794-IT8

Number of Inputs	8 Channels
Module Location	Cat. No. 1794-TB3T, -TB3, -TB3S, -TB2, or -TB3TS Terminal Base Unit ¹
Nominal Input Voltage Ranges	±76.5mV
Supported Thermocouple Types	Type B: 300 to 1800°C (572 to 3272°F) Type C: 0 to 2315°C (32 to 4199°F) Type E: -270 to 1000°C (-454 to 1832°F) Type J: -210 to 1200°C (-346 to 2192°F) Type K: -270 to 1372°C (-454 to 2502°F) Type N: -270 to 1300°C (-454 to 2372°F) Type R: -50 to 1768°C (-58 to 3214°F) Type S: -50 to 1768°C (-58 to 3214°F) Type T: -270 to 400°C (-454 to 752°F) Type TXK/XK (L): -200 to 800°C (-328 to 1472°F)
Resolution	16 bits (2.384 µV typical)
Accuracy with filter @ 24°C (±0.5°C)	0.025% Full Scale Range maximum
Accuracy without filter @ 24°C (±0.5°C)	0.05% Full Scale Range maximum
Data Format	16-bit 2's complement or offset binary (unipolar)
Normal Mode Noise Rejection	-60db @ 60Hz
Common Mode Rejection	-115db @ 60Hz; -100db @ 50Hz
Common Mode Input Range	+10V maximum
Channel to Channel Isolation	±10V
System Throughput	325ms (1 channel scanned), programmable to 28ms 2.6s (8 channels scanned), programmable to 224ms
Settling Time to 100% of final value	Available at system throughput rate
Open Circuit Detection	Out of range reading (upscale)
Open Thermocouple Detection Time	Available at system throughput rate
Overvoltage Capability	35V dc, 25V ac continuous @ 25°C 250V peak transient
Channel Bandwidth	0 to 2.62Hz (-3db)
RFI Immunity	Error of less than 1% of range at 10V/M 27 to 1000MHz
Input Offset Drift With Temperature	±6 µV/°C maximum
Gain Drift With Temperature	10ppm/°C maximum
Overall Drift With Temperature	50ppm/°C of span (maximum)
Cold Junction Compensation Range	0 to 70°C
Cold Junction Compensator	Kit Cat. No. 1794-CJC2 (contains 2 CJC's)
Indicators	1 red/green power/status indicator
Flexbus Current	20mA
Power Dissipation	3W maximum @ 31.2V dc
Thermal Dissipation	Maximum 10.2 BTU/hr @ 31.2V dc
Keyswitch Position	3

General Specifications

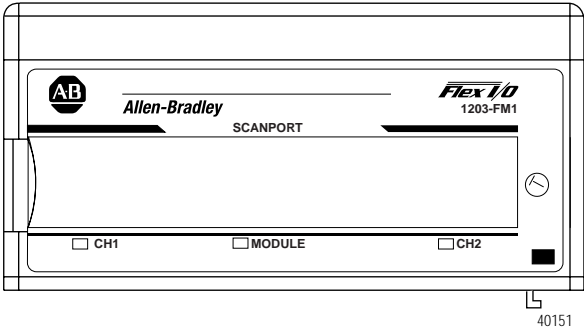
External dc Power Supply Voltage Voltage Range	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 19.2V dc for ambient temperatures < 55°C 24V dc for ambient temperatures < 55°C 31.2V dc for ambient temperatures < 40°C See derating curve.
Supply Current	150mA @ 24V dc
Dimensions HxWxD	1.8mm x 3.7mm x 2.1mm (46in x 94in x 53in)
Environmental Conditions	0 to 55°C (32 to 131°F) See derating curve.
Operational Temperature	-40 to 85°C (-40 to 185°F)
Storage Temperature	5 to 95% noncondensing (operating)
Relative Humidity	5 to 80% noncondensing (nonoperating)
Shock	30 g peak acceleration, 11(±1)ms pulse width
Operating	50 g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5 g @ 10-500Hz per IEC 68-2-6
Vibration	
Publications	
Installation Instructions	1794-5.21
User Manual	1794-6.5.7
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified  Class I Zone 2 Group IIC certified


¹ Use a 1794-TB3, -TB3S, or -TB2 terminal base unit for mV inputs only. You must use a 1794-TB3T and -TB3TS terminal base unit when using thermocouple inputs.

Derating Curve

The area within the curve represents the safe operating range for the module under various conditions of user supplied 24V dc supply voltages and ambient temperatures.

40156



Recommended Terminal Base	Compatible Terminal Base(s)
	None

ATTENTION



The 1203-FM1 may require up to twice the adapter power supply current of standard FLEX I/O modules. When installing FLEX I/O modules, you can use a maximum of four 1203-FM1 modules with any FLEX I/O adapter. As a general rule, each 1203-FM1 requires the power capacity of two of the standard FLEX I/O modules, so you cannot install as many standard modules as you normally would when using the 1203-FM1. Refer to the following chart to determine the number of 1203 and standard modules that may be installed together in your system.

Remove field-side power before removing or inserting this module. This module is designed so you can remove and insert it under backplane power. When you remove or insert a module with field-side power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices causing unintended machine motion
- causing an explosion in a hazardous environment

Repeated electrical arcing causes excessive wear to contact on both the module and its mating connector. Worn contacts may create electrical resistance.

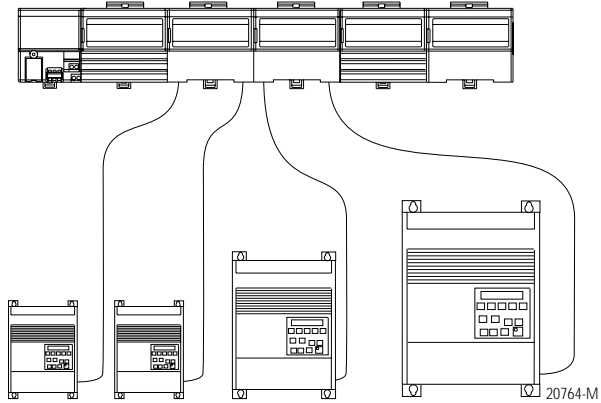
If you are using this number of standard (1794) modules:	Then, the maximum number of 1203 modules that you can use is:	The number of SCANport connections provided is:
7 or 8	0	0
5 or 6	1	2
3 or 4	2	4
1 or 2	3	6
0	4	8

Wiring

To wire the 1203 base used by this module, connect a SCANport cable from the SCANport device to the desired channel. SCANport cables are available in either male-to-male or male-to-female configurations. You can connect cables of up to 10 meters (33 feet) between a SCANport device and any SCANport peripheral.

If you use a port expander, you must subtract the cable length between any device and the expander from the maximum cable length used to connect a peripheral.

The following diagram shows a typical network configuration:



Specifications - 1203-FM1

Input Voltage Rating	5V supplied from flexbus
Indicators	3 bi-color
Module Location	Cat. No. 1203-FB1 Terminal Base Unit
Flexbus Current	160mA maximum
Power Consumption	0.8W
Keyswitch Position	1













General Specifications

Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	
Operating	5 to 95% noncondensing
Non-operating	5 to 80% noncondensing
Shock	
Operating	30g peak acceleration, 11(±1)ms pulse width
Non-operating	50g peak acceleration, 11(±1)ms pulse width
Vibration	Tested 5 g @ 10-500Hz per IEC 68-2-6
Dimensions HxWxD	1.8mm x 3.7mm x 2.1mm (46in x 94in x 53in)

Use the following table to determine which counter module will meet your application needs.

Counter Module	Purpose	See Page
1794-IJ2	24V dc 2 input frequency module	135
1794-VHSC	24V dc 2 channel very high speed counter module (use with 1794-ACN15 or -ACNR15 only)	139
1794-ID2	24V dc 2 input pulse counter module	142
1794-IP4	12/24V dc 4 input pulse counter module	145

The following table illustrates the recommended terminal base unit(s) for each counter module.

FLEX I/O Product	Catalog Number	Recommended Terminal Base	Compatible Terminal Base(s)
Counter			
Frequency Input Module	1794-IJ2		
Very High Speed Counter Module (use with 1794-ACN15 or -ACNR15 only)	1794-VHSC		 For use with 1794-ACN(R)15 only.
2- Channel Pulse Counter Input Module	1794-ID2		   Auxiliary terminal strips are required when using the TBN or TBNF for the ID2
4-Channel Pulse Counter Input Module	1794-IP4		   Auxiliary terminal strips are required when using the TBN or TBNF for the IP4

Ask these three questions when deciding on which counter module would best fit your application:

1. What is the application?
2. What is the desired counter mode?
3. What field devices, signal levels, and signal type are being connected to the counter module?

Catalog Number	Network Compatibility
1794-IJ2	ControlNet, DeviceNet, RIO, and referenced partners
1794-VHSC	1794-ACN15 or -ACNR15
1794-ID2	ControlNet, DeviceNet, RIO, and referenced partners
1794-IP4	ControlNet, DeviceNet, RIO, and referenced partners

1794-IJ2

Description: Essentially a tachometer with the capability of reporting frequency, acceleration, and direction. Outputs are activated by alarms. Input devices range from magnetic pickup to flowmeters, to incremental encoders to proximity detectors.

This intelligent I/O module is designed to perform high-speed frequency algorithms. The module provides 2 frequency inputs, 2 gate inputs, and 2 outputs. The frequency inputs are capable of accepting frequencies up to 32KHz. The module accepts and returns binary data.

The 1794-IJ2 measures frequency over a user-specified time interval. A frequency calculation can start before the time interval has elapsed, if a user-specified number of frequency input pulses have occurred.

The module's primary target is high-speed, accurate frequency measurement. As such, a high-speed internal clock is synchronized with the frequency input to count over a user-selected sampling time or a user-defined number of frequency input pulses. All power for input devices (24V dc) is supplied by the I/O module.

Applications: Any application requiring rotational control including turbine generators, motors, drives, gears, shafts, etc.

Signal Types: Input = 50mV, 500mV, 3V, 6V, 24V sine or square wave up to 32KHz Output = Two 24V dc digital source outputs current-limited to 1A

Network Compatibility: All networks supported by FLEX I/O

1794-VHSC

Description: A counter module with two incremental quadrature encoder interfaces, each with three inputs (A, B, and Z). Each input module as \pm inputs for connection to pulse transmitters with complementary or non-complementary signals.

The counter can count one or two pulse trains for up/down counting and detection of a selectable number of edges (X1, X2, X4). Each of the two counters has an upper limit of 1MHz, a 24-bit counter register, a preset register, and a latch register.

Power to the module is supplied from an external power supply. Outputs can be configured for overlapping, multiple windows, and/or pulse with modulation.

Applications: Typical applications include packaging, material handling, flow monitoring, cut-to-length, motor speed control and monitoring.

Signal Types: Input = 5V, 15V, or 24V dc square wave limited to 1MHz Output = Four 5V or 12-24V dc digital source outputs, on-state current maximum 1A, maximum current per output pair is .5A

Network Compatibility: Use with 1794-ACN(R)15 ControlNet only.

1794-ID2

Description: A counter module with 2 incremental quadrature encoder interfaces, each with four inputs (A, B, Z, and G).

Each input module has \pm inputs for connection to pulse transmitters with complementary or non-complementary signals.

The counter can count one or two pulse trains for up/down counting and detection of a selectable number of edges (X1, X2, X4). Each of the two counters has an upper limit of 100KHz, a 16-bit counter register, a preset register, and a latch register.

Power to the module is supplied from an external power supply.

Applications: Typical applications include quantity counting, positioning, and speed calculations.

Signal Types: Input = 12V to 24V square wave limited to 100KHz Output = None

Network Compatibility: All networks supported by FLEX I/O

1794-IP4

Description: A counter module with 4 pulse transmitter interfaces (12-24V dc), each with two signal inputs (N and D).

Each input module has \pm inputs for connection to pulse transmitters.

Each interface may be configured for: a) period of time measurement using one 16-bit counter and accumulating pulse counting using the other 16-bit counter or b) period time measurement using a 32-bit counter.

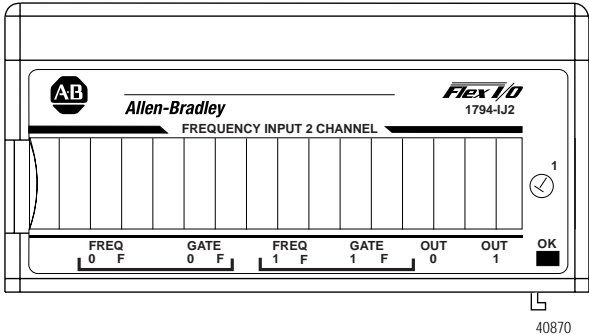
The number of periods to be measured is selectable (1, 2, 4, 8, 16, 32, 64, and 128) via the gate control.



Power to the module is supplied from an external power supply.

Applications: Typical applications include counting pulses from flow meters and density meters. Quantity counting and speed calculations are examples of other applications.

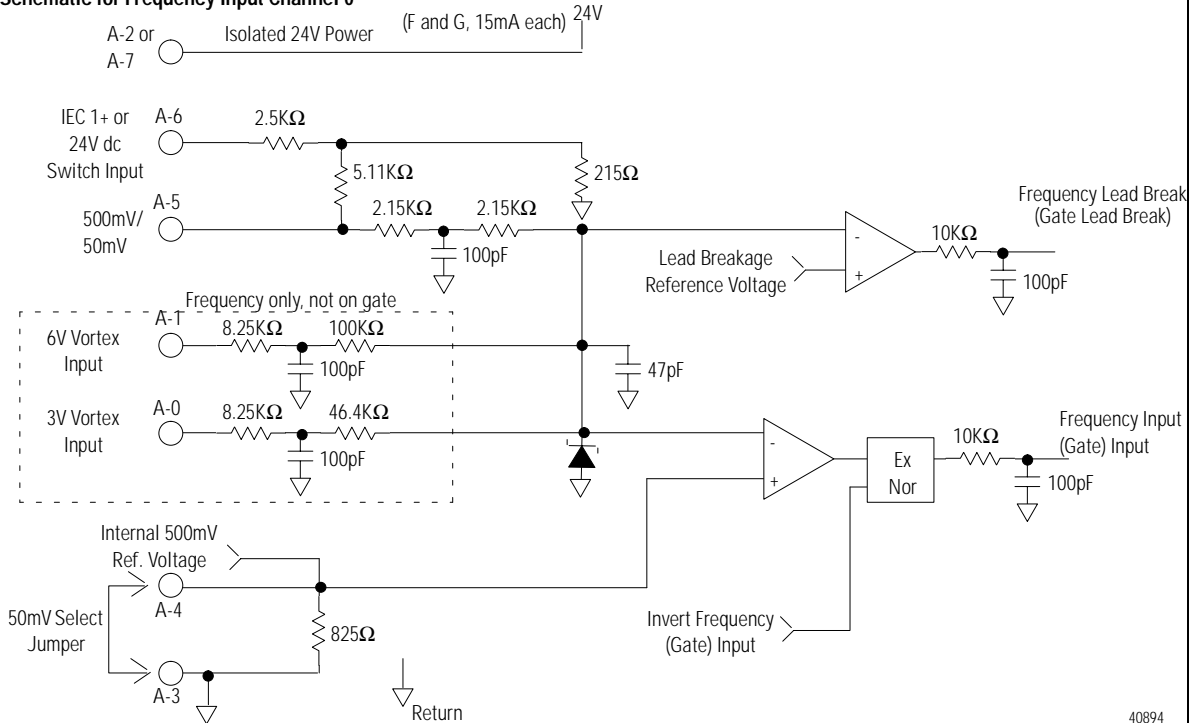
Signal Types: Input = 12V to 24V square wave limited to 100KHz Output = None

Network Compatibility: All networks supported by FLEX I/O

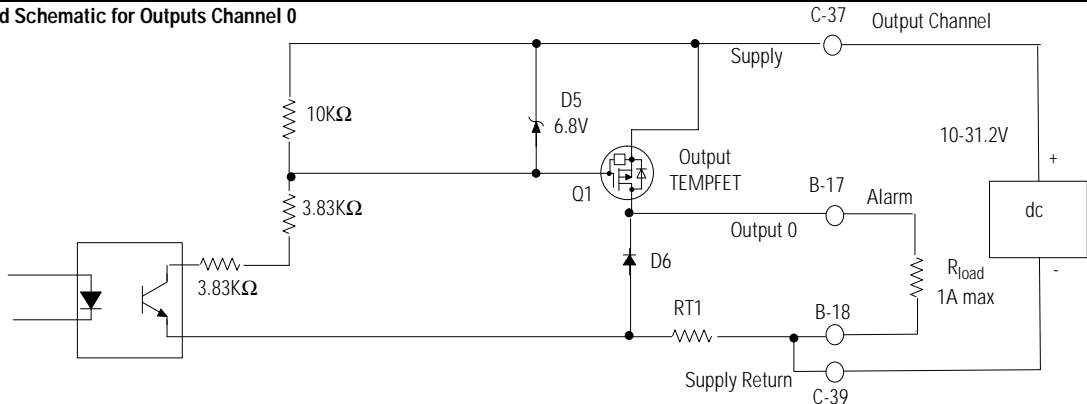


Recommended Terminal Base	Compatible Terminal Base(s)
	

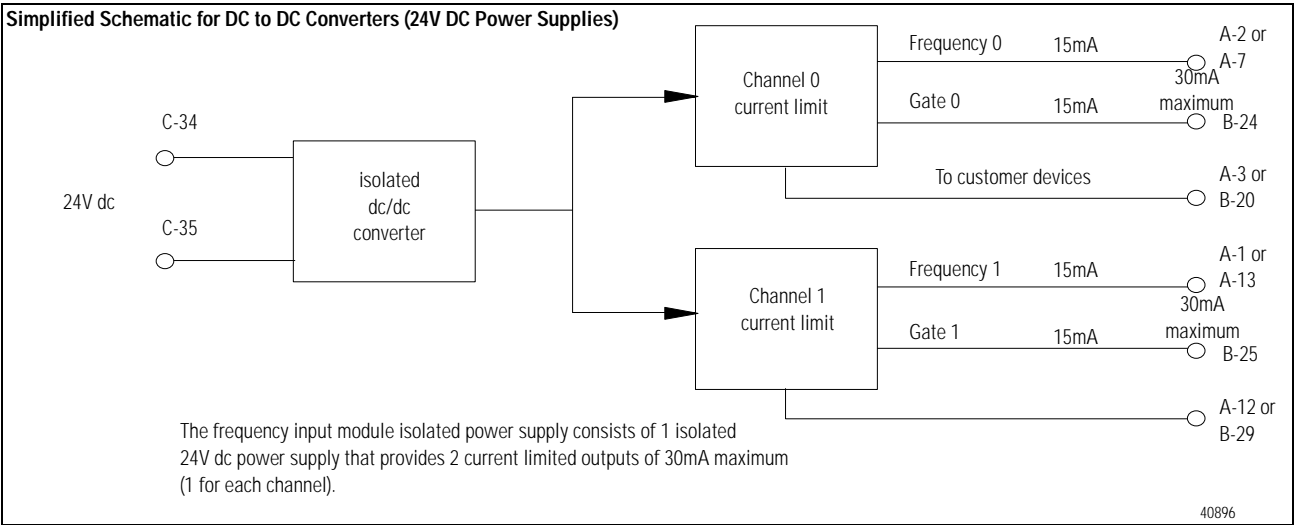
Simplified Schematic for Frequency Input Channel 0



Simplified Schematic for Outputs Channel 0

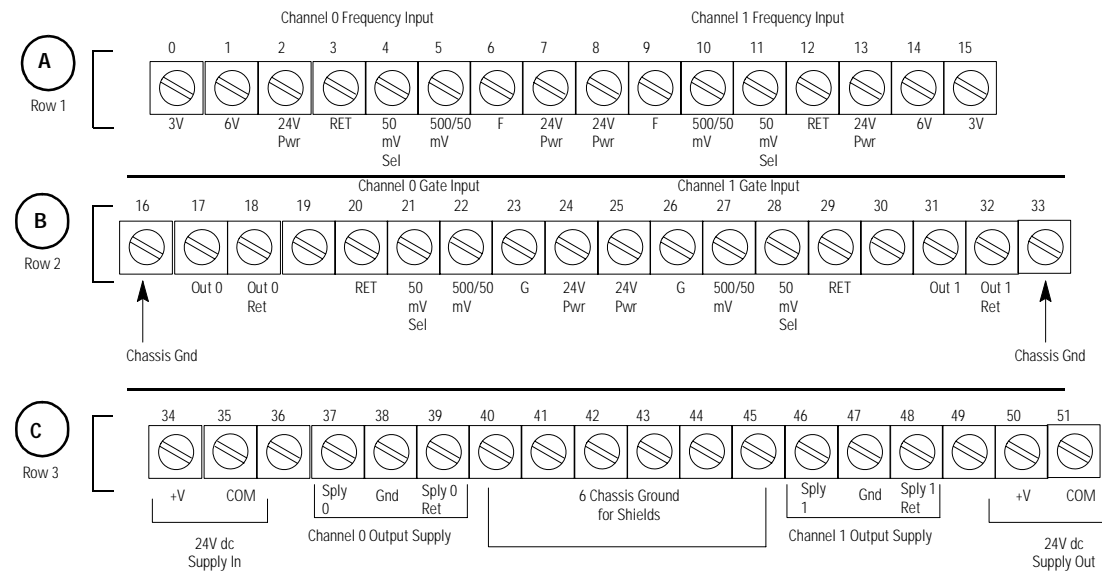


Customer supplied power, ranging from +10V to +31.2V dc, is connected internally to the power output transistor. When an output is turned on, current flows into the source out of the drain, through the load connected to the ground of the customer supply (customer return). Diode D6 protects the power output transistors from damage due to inductive loads. Output Q1 is a thermally protected FET and will turn off @ 3A (approximately). After an output goes into thermal shutdown, you must fix the cause of the shutdown and toggle the outputs ON and OFF to reenergize the output. RT1 protects D6 and Q1 if power supply polarity is reversed.



Wiring

connections on
1794-TB3G shown



All 24V dc pwr and ret terminals are sourced power provided for the sensors. Do not connect external power to these terminals.

Provides power for up to four 24V dc devices at 15mA each, for a total of 60mA. Channel 0 power and Channel 1 power have current limiters, each rated at 30mA max.

ATTENTION



To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 10m (33ft) for dc power cabling.

Do not daisy chain power or ground from the RTD terminal base unit to any ac or dc digital module terminal base units.

ATTENTION



Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

	Channel 0 Terminals ⁵			Channel 1 Terminals ⁵			
Type of Inputs	Power	Input	RET ⁶	Power	Input	RET ⁶	GND ⁵
Frequency							
24V dc IEC1+ Proximity ^{1,2}	A-7	A-6	A-3	A-8	A-9	A-12	
24V dc Contact Switch ³	A-7	A-6	A-3	A-8	A-9	A-12	
500mV ac Magnetic Pickup	A-7	A-5	A-3	A-8	A-10	A-12	
50mV ac Magnetic Pickup ⁴	A-7	A-5	A-3	A-8	A-10	A-12	
6V ac Vortex	A-2	A-1	A-3	A-13	A-14	A-12	
3V ac Vortex	A-2	A-0	A-3	A-13	A-15	A-12	

¹ As defined by standard IEC 1131-2.

² RET not used on 2-wire devices.

³ Add external resistor from 24V to F or G for wire-off detection (0.4mA).

⁴ Add a jumper between 50mV and RET (Frequency - channel 0=4 to 3; channel 1=11 to 12). (Gate - channel 0=21 to 20; channel 1=28 to 29).

⁵ Connect cable shields to GND terminals.

⁶ All 4 RET terminals (ch 0 and 1, Freq, Gate) are internally connected together.

	Channel 0 Terminals ⁵			Channel 1 Terminals ⁵			
Type of Inputs	Power	Input	RET ⁶	Power	Input	RET ⁶	GND ⁵
Gate							
24V dc IEC1+ Proximity ^{1,2}	B-24	B-23	B-20	B-25	B-26	B-29	
24V dc Contact Switch ³	B-24	B-23	B-20	B-25	B-26	B-29	
500mV ac Magnetic Pickup	B-24	B-22	B-20	B-25	B-27	B-29	
50mV ac Magnetic Pickup ⁴	B-24	B-22	B-20	B-25	B-27	B-29	

¹ As defined by standard IEC 1131-2.

² RET not used on 2-wire devices.

³ Add external resistor from 24V to F or G for wire-off detection (0.4mA).

⁴ Add a jumper between 50mV and RET (Frequency - channel 0=4 to 3; channel 1=11 to 12). (Gate - channel 0=21 to 20; channel 1=28 to 29).

⁵ Connect cable shields to GND terminals.

⁶ All 4 RET terminals (ch 0 and 1, Freq, Gate) are internally connected together.

Output Alarm Connections	Channel 0 Terminals ¹				Channel 1 Terminals ¹			
	Sply +	Sply RET	Out +	Out RET	Sply +	Sply RET	Out +	Out RET
Supply Connection	C-37	C-39			C-46	C-48		
Output Connection			B-17	B-18			B-31	B-32

¹ Connect cable shields to GND connections.

Specifications - 1794-IJ2

Module Location	Cat. No. 1794-TB3G or -TB3GS Terminal Base Unit
Isolation Voltage	1250 Vrms/V ac between user input (F & G) and system, user output (0 & 1) and system, and user power and system 100% tested at 2121V dc for 1s 500 Vrms/V ac between 4 user inputs and 2 user outputs, user output 0 and output 1 100% tested at 850V dc for 1s
Processing Time	≤4ms
Flexbus Current	30mA @ 5V dc
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	Maximum 15.6 BTU/hr @ 31.2V dc
Indicators (Field-Side Driven, Logic-Side Indication)	1 green/red power/status indicator Input: 4 yellow status indicators (0, 1) - logic side 4 red wire-off indicators (F) - logic side Output: 2 yellow status indicators (0, 1) - logic side
Keyswitch Position	1

Input Specifications

Number of Input Channels	2
Number of Inputs per Channel	2 - Frequency and Gate (gate used to establish direction)
Input Frequency (max)	1-32Kz w/sine wave; 1-32KHz w/square wave input
Frequency Value (max)	32,767 or 3,276.7 (dependent on range)
Input Pulse Width (min)	20µs
Resolution/Accuracy	Refer to resolution/accuracy table
On-State Voltage (min)	10V (24V IEC+1 proximity, encoder input or switch inputs)
On-State Voltage (nominal) (selected by terminal base connections)	50mV ac, 28V ac peak - Extended Magnetic Pickup 500mV ac, 28V ac peak - Magnetic Pickup ≤3V - vortex flowmeter low range ≥6V - vortex flowmeter high range 24V dc IEC1+ proximity or encoder input 24V dc contact switch input
On-State Voltage (max)	Limited to isolated 24V dc power supply
On-State Current Minimum Nominal Maximum	2.0mA 9.0mA 10.0mA
Off-State Voltage (max)	5.0V dc on 24V dc IEC1+ Terminal
Off-State Current (min)	1.5mA into 24V dc IEC1+ Terminal
Wire-Off Detection	0.4mA for proximity, encoder, or contact switch with 50kΩ shunt resistor




Input Specifications (continued)

Frequency Input Impedance	>5K Ω for 50mV extended magnetic pickup >5K Ω for 500mV magnetic pickup >10K Ω for 3V vortex flowmeter >10K Ω for 6V vortex flowmeter >2.5K Ω for 24V dc IEC1+ proximity or encoder input >2.5K Ω for 24V dc contact switch input
Gate Input Impedance	>5K Ω for 50mV extended magnetic pickup >5K Ω for 500mV magnetic pickup >2.5K Ω for 24V dc IEC1+ proximity or encoder input >2.5K Ω for 24V dc contact switch input

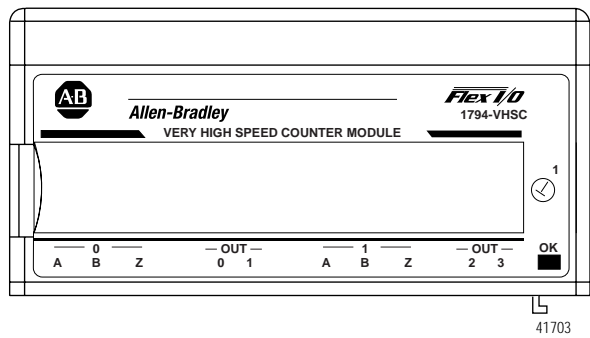
Output Specifications (meets IEC 1A 24V dc output specification)

Number of Outputs	2 isolated
Output Voltage Source	Customer supplied
Output Voltage Minimum Nominal Maximum	10V dc 24V dc 31.2V dc
Off-State Voltage (maximum)	31.2V dc
On-State Current Minimum Maximum	1.0mA per output minimum 1.0A per channel sourced out of module Current Limited: All outputs can be on simultaneously without derating
Surge Current	2A for 50ms, repeatable every 2s
Off-State Leakage (max)	<300 μ A @ 31.2V dc
On-State Voltage Drop (max)	0.9V dc @ 1A
Output Control	Outputs individually assignable to: Frequency,% full scale, or acceleration alarm
Output Switching Time	Triggered by frequency alarm or acceleration alarm Turn On: <0.5ms Turn Off: <1ms



General Specifications

External dc Power Supply Voltage Voltage Range Supply Current	(Input for +5V logic and 24V dc/dc converters) 24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 220mA @ 19.2V dc; 180mA @ 24V dc; 140mA @ 31.2V dc
Isolated dc Power Supply Voltage Voltage Range Supply Current Peak ac Ripple	(Output to sensors and encoders) 24V dc nominal 21.6 to 26.4V dc 0-60mA maximum @ 24V dc (4 devices @ 15mA = 60mA) 100mV maximum
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating) 30g peak acceleration, 11(\pm 1)ms pulse width 50g peak acceleration, 11(\pm 1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Input Conductors Wire Category Length (maximum)	Belden 8761 2 ¹ 304.8m (1000ft)
Output Conductors Wire Category	Belden 8761 2 ¹
Publications Installation Instructions User Manual	1794-5.49 1794-6.5.11
Agency Certification	  Class I Division 2 certified Groups A, B, C, D certified Class I Zone 2 Group IIC certified 

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Wiring and Grounding Guidelines for Noise Immunity."



41703

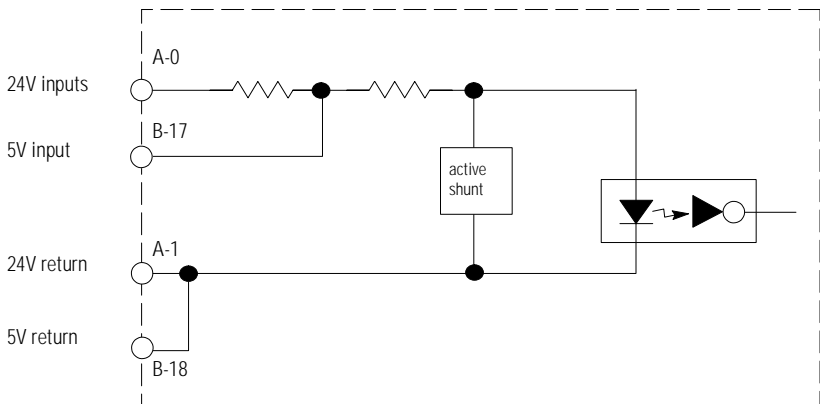
Recommended Terminal Base	Compatible Terminal Base(s)
	

ATTENTION



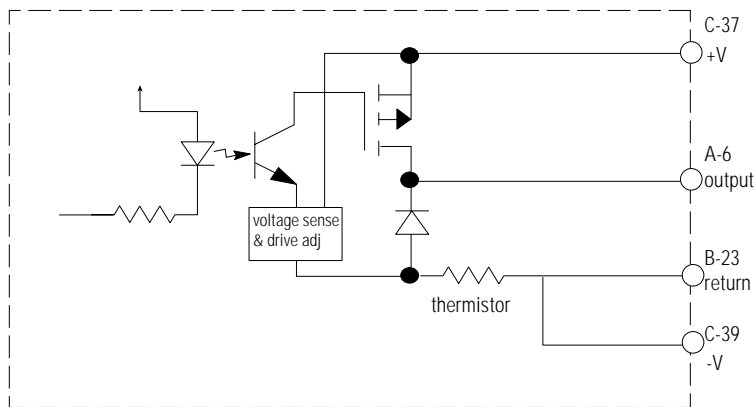
This module must be used with 1794-ACN15 or -ACNR15 series B or later ControlNet adapters in ControlNet systems.

Simplified Schematic for Input A of Channel 0



42181

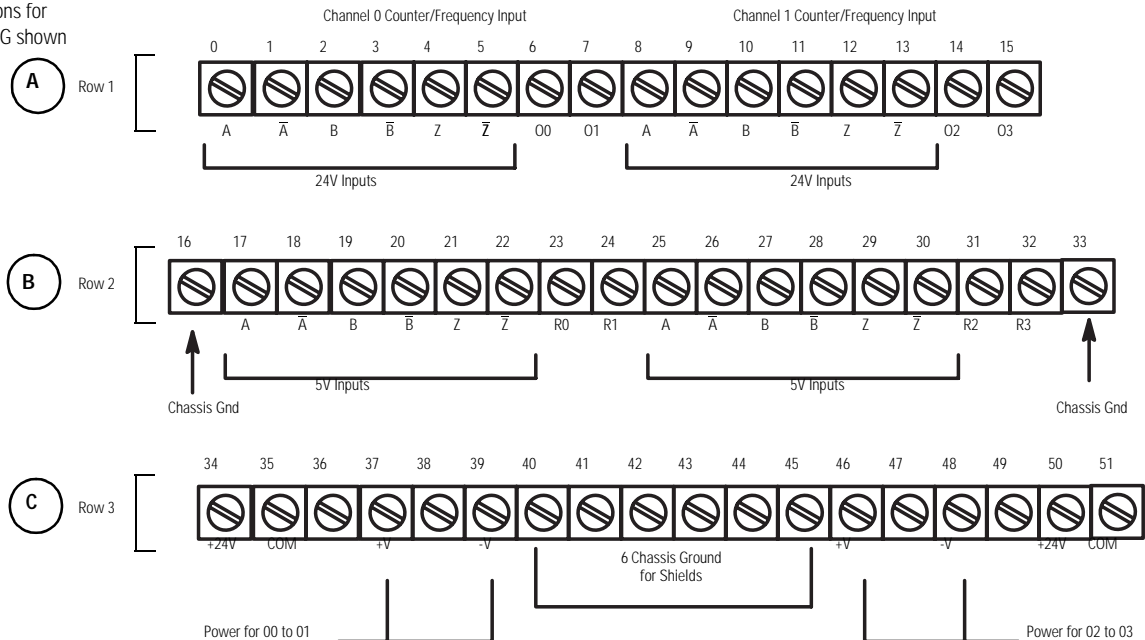
Simplified Schematic for Output 0



42182

Wiring

Connections for
1794-TB3G shown



Where: A, \bar{A} = incremental encoder input A (+5 or +24V dc)
B, \bar{B} = incremental encoder input B (+5 or +24V dc)
Z, \bar{Z} = incremental encoder input Z (+5 or +24V dc)
O = sourcing outputs
R = returns for sourcing outputs
+V = +5 or +24V dc isolated power externally supplied for outputs (1A max)
-V = negative isolated power connection (1A max)
+24V dc = 24V dc terminal base power for module
COM = return for +24V dc terminal base power for module
Chassis Gnd = chassis ground for input or output cable shields

41704

ATTENTION



To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 10m (33ft) for module dc power cabling.

Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

Incremental Encoder Inputs	Channel 0		Channel 1	
	+24V Inputs	+5V Inputs	+24V Inputs	+5V Inputs
Input A	A-0	B-17	A-8	B-25
Input \bar{A}	A-1	B-18	A-9	B-26
Input B	A-2	B-19	A-10	B-27
Input \bar{B}	A-3	B-20	A-11	B-28
Input Z	A-4	B-21	A-12	B-29
Input \bar{Z}	A-5	B-22	A-13	B-30

Outputs	Sourcing Out	Return	Outputs	Sourcing Out	Return
00	A-6	B-23	02	A-14	B-31
01	A-7	B-24	03	A-15	B-32
+24V		Terminals B-34 and C-50			
24V COM		Terminals B-35 and C-51			
+5V or +24V output power		Terminals B-37 and C-46			
-V output power		Terminals B-39 and C-48			
Chassis Ground		Terminals B-16, B-33 and C-40 thru C-45			


Specifications - 1794-VHSC**Input Specifications**

Module Location	Cat. No. 1794-TB3G or -TB3GS Terminal Base Unit
Number of Inputs per Counter	2 groups of A/A, B/B, and Z/Z pairs with 5V dc or 15-24V dc terminations
Input Voltage	5V dc or 15-24V dc (determined on terminal base terminations)
Input Current (Typical)	5V dc terminations: 19.1mA @ 5V dc 25.7mA @ 6V dc 15-24V dc terminations: 6.1mA @ 15V dc 10.2mA @ 24V dc
Input Off-State Voltage	5V dc terminations: $\leq 1.25V$ dc 15-24V dc terminations: $\leq 1.8V$ dc
Input Off-State Current	$\leq 0.250mA$
Input On-State Voltage	5V dc terminations: $\geq 2.6V$ dc 15-24V dc terminations: $\geq 12.5V$ dc
Input On-State Current	$\geq 5mA$
On-State Voltage (max)	5V dc terminations: $\pm 6V$ 15-24V dc terminations: Refer to derating curve
Input Frequency (max)	1.0MHz counter and encoder X1 (no filters) 500kHz encoder X2 (no filters) 250kHz encoder X4 (no filters)
Input Filter Selections	5: Off, 10 μs , 100 μs , 1.0ms, 10.0ms per A/B/Z group

Output Specifications

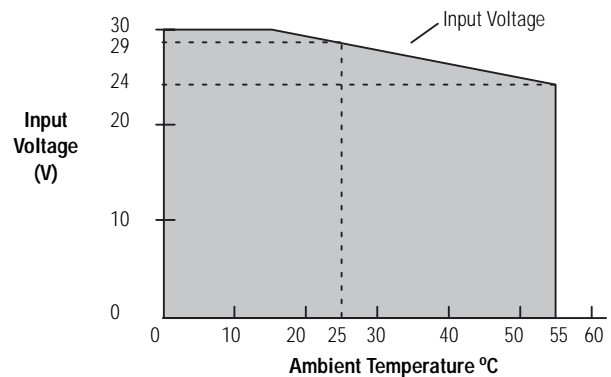
Number of Outputs	2 isolated groups of 2 (0.5A max @ 5V dc; 1.0A max @ 12-24V dc)
Output Control	Outputs can be tied to 8 compare windows
Output Supply Voltage Range	5-7V dc; 10-31V dc
Off-State Leakage Current	$\leq 0.3mA$
On-State Voltage Drop	5V operation - 0.5A 12-24V operation - 1.0A
On-State Current Maximum	5V operation - 0.5A 12-24V operation - 1.0A
Maximum Current per Output Pair	5V operation - 0.9A 12-24V operation - 4.0A
Short Circuit Current	5V operation - 0.9V dc @ 0.5A 12-24V operation - 0.9V dc @ 1.0A Outputs are short circuit protected and turned off until power is cycled.
Delay Time Off to On On to Off	25 μs (load dependent) 150 μs (load dependent)
Isolation Voltage	100% tested @ 850V dc for 1s between six isolated areas, including: flexbus module 24V dc power A0/B0/Z0 inputs A1/B1/Z1 inputs O0/O1 and output power supply 1 O2/O3 and output power supply 2
Flexbus Current	75mA @ 5V dc (with terminal base power off)
Power Dissipation	5W maximum @ 31.2V dc
Thermal Dissipation	Maximum 17.1 BTU/hr @ 31.2V dc
Indicators	1 green/red power/status indicator 6 yellow input status indicators - logic side 4 yellow output status - logic side
Keyswitch Position	1

General Specifications

Module Location	Cat. No. 1794-TB3G or -TB3GS terminal base unit
Dimensions (HxWxD)	45.7mm x 94.0mm x 53.3mm (1.8in x 3.7in x 2.1in)
External dc Power ¹ Supply Voltage Voltage Range Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 100mA @ 24V dc
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	0 to 55°C (32 to 131°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing (operating) 5 to 80% noncondensing (non-operating) 30g peak acceleration, 11(± 1)ms pulse width 50g peak acceleration, 11(± 1)ms pulse width Tested 5g @ 10-500Hz per IEC 68-2-6
Shock Operating Nonoperating Vibration	
Conductors/Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	2 ²
Publications Installation Instructions User Manual	1794-5.67 1794-6.5.10
Agency Certification	

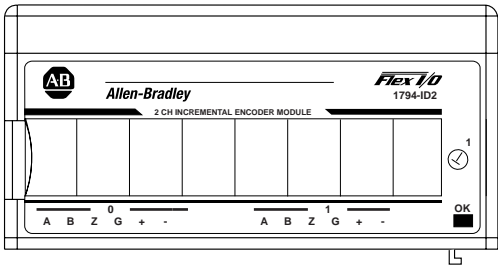
1 Does not represent power required to supply the inputs or outputs.

2 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Wiring and Grounding Guidelines for Noise Immunity."







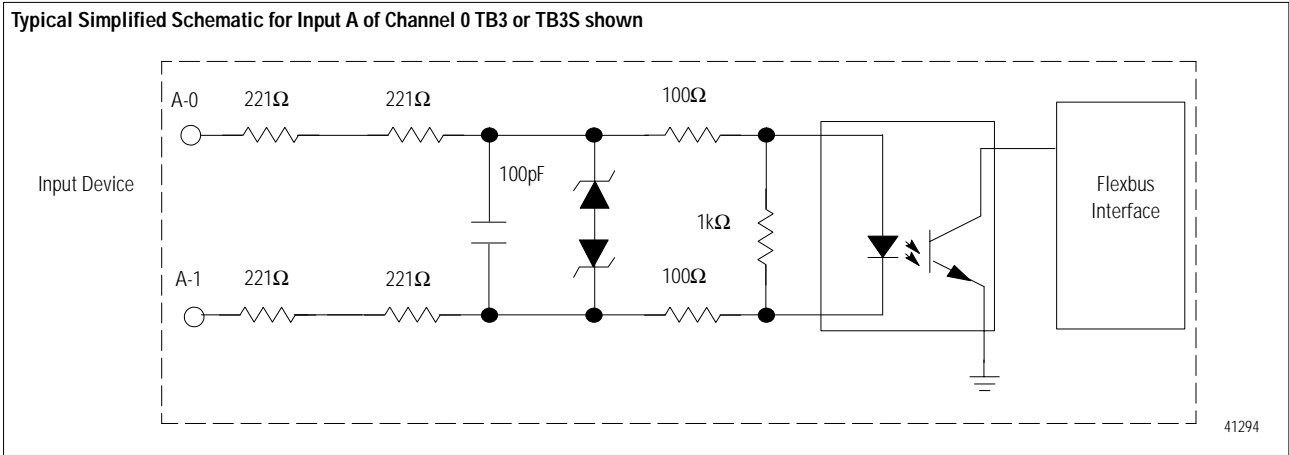
The area within the curve represents the safe operating range for the module under various conditions of user supplied 24V dc supply voltages and ambient temperatures. This includes all possible mounting positions, including inverted horizontal.

41702



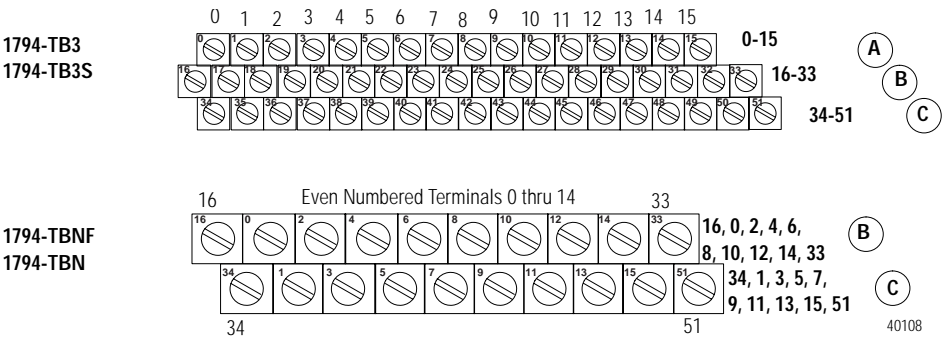
41293

Recommended Terminal Base	Compatible Terminal Base(s)
	   Auxiliary terminal strips are required when using the TBN or TBNF for the ID2



41294

Wiring

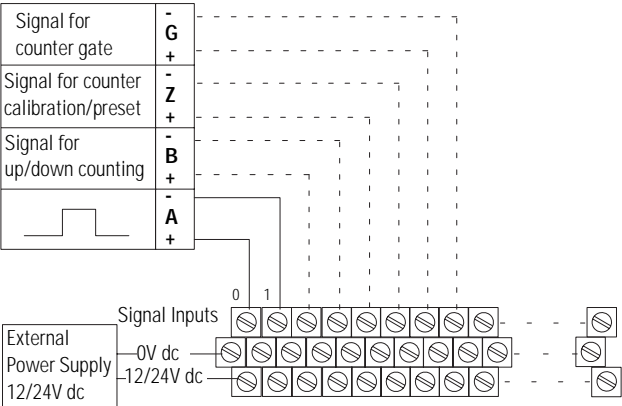


	Terminal Base Units 1794-TB3 and -TB3S			Terminal Base Units 1794-TBN and -TBNF ¹	
	Signal	0V dc	12/24V dc	Signal	Input
Pulse Counter Channel 0					
A+	A-0	B-17	C-35	B-0	
A-	A-1	B-18	C-36	C-1	
B+	A-2	B-19	C-37	B-2	
B-	A-3	B-20	C-38	C-3	
Z+	A-4	B-21	C-39	B-4	
Z-	A-5	B-22	C-40	C-5	
G+	A-6	B-23	C-41	B-6	
G-	A-7	B-24	C-42	C-7	
Pulse Counter Channel 1					
A+	A-8	B-25	C-43	B-8	
A-	A-9	B-26	C-44	C-9	
B+	A-10	B-27	C-45	B-10	
B-	A-11	B-28	C-46	C-11	
Z+	A-12	B-29	C-47	B-12	
Z-	A-13	B-30	C-48	C-13	
G+	A-14	B-31	C-49	B-14	
G-	A-15	B-32	C-50	C-15	
0V dc	Terminals 16 and 33				
12/24V dc	Terminals 34 and 51				

1 Auxiliary terminal blocks are required when using these terminal base units.

Example of Incremental Encoder Wiring

Pulse Counter Channel 0 (with 1 pulse train)

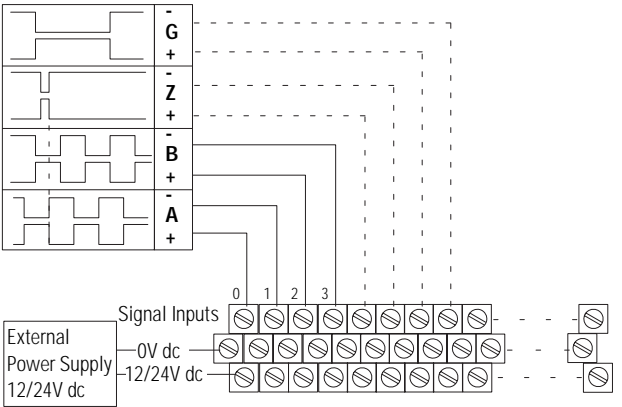


Example of pulse transmitter with 1 pulse trains. For connection of channel 2, refer to the wiring diagram.

Note: Dotted lines indicate signals not always used.

41295

Pulse Counter Channel 0 (with 2 pulse trains)



Example of pulse transmitter with 2 pulse trains, with or without reference and/or gate function. For connection of channel 2, refer to the wiring diagram.


Note: Dotted lines indicate signals not always used.

41296

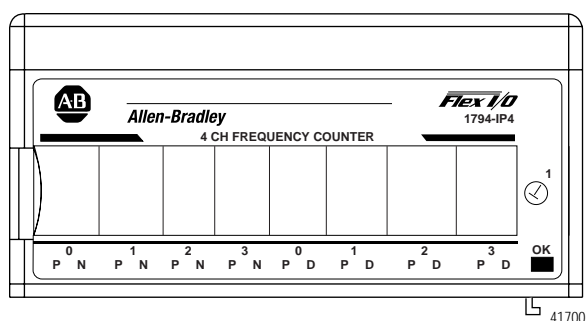
Specifications - 1794-ID2**Input Specifications**





Number of Counters	2
Number of Inputs per Counter	4 inputs (A, B, Z, G)
Input Pulse Width (Minimum)	Each signal condition must be stable for at least 2 μ s to be recognized
Counting Frequency	100KHz maximum
Input Range	
Input ON	Maximum 26.4V dc (24V dc \pm 10%) Minimum 6V dc
Input OFF	Maximum 3V dc Minimum -26.4V dc
Input Current (Typical)	3mA @ 6V dc 9mA @ 12V dc 15mA @ 24V dc

General Specifications

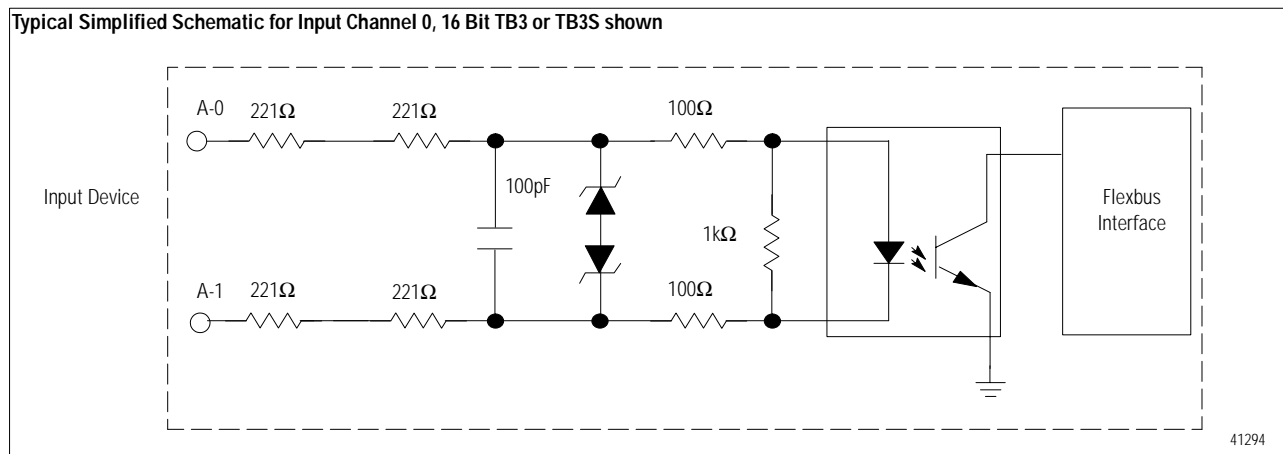
Module Location	Cat. No. 1794-TB3, -TB3S, -TBN, and -TBNF Terminal Base Units
Isolation Voltage	500V dc
Flexbus Current	5mA @ 5V dc
Power Supply	12-24V dc (\pm 10%)
Current Consumption from External Power Supply	150mA @ 12V dc 75mA @ 24V dc
Power Dissipation	5W maximum @ 26.4V dc
Thermal Dissipation	Maximum 17.1 BTU/hr @ 26.4V dc
Indicators (field side driven, logic side indication)	1 green/red power/status indicator Input: 12 yellow status indicators - logic side
Keyswitch Position	1
Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F) Note: Do not connect maximum input voltage simultaneously to all inputs if the module ambient temperature is expected to exceed 40°C (104°F).
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 90% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock	30g peak acceleration, 11(\pm 1)ms pulse width
Operating Nonoperating	50g peak acceleration, 11(\pm 1)ms pulse width
Vibration	Tested 5g @ 10-500Hz per IEC 68-2-6
Input Conductors	
Wire	Belden 8761
Category	2 ¹
Length (Maximum)	1000ft (304.8m)
Publications	
Installation Instructions	1794-5.63
User Manual	1794-6.5.15
Agency Certification	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770, 4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

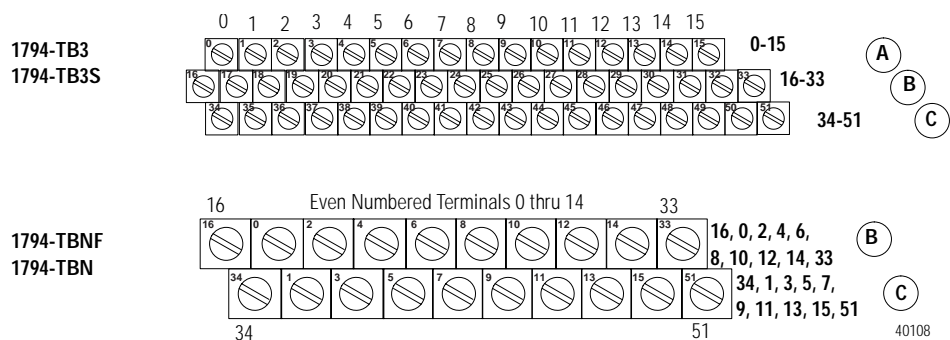


Recommended Terminal Base	Compatible Terminal Base(s)
 <p>Terminal base TB3</p>	   <p>Auxiliary terminal strips are required when using the TBN or TBNF for the IP4</p>

Typical Simplified Schematic for Input Channel 0, 16 Bit TB3 or TB3S shown



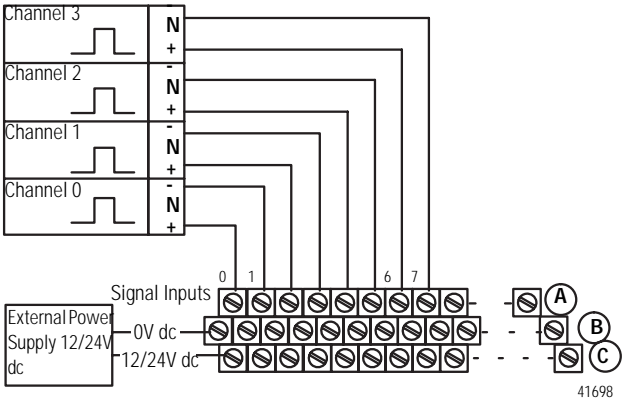
Wiring



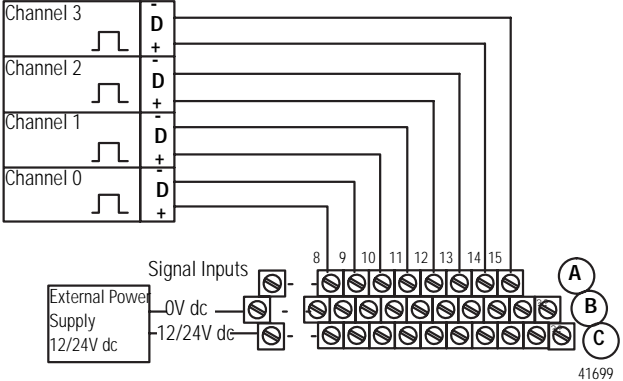
Channel		Terminal Base Units 1794-TB3 and -TB3S			Terminal Base Units 1794-TBN and -TBNF ¹	
		Signal	0V dc	12/24V dc	Signal	Input
16-Bit Period Time Measurement						
0	N+	A-0	B-17	C-35	B-0	
	N-	A-1	B-18	C-36	C-1	
1	N+	A-2	B-19	C-37	B-2	
	N-	A-3	B-20	C-38	C-3	
2	N+	A-4	B-21	C-39	B-4	
	N-	A-5	B-22	C-40	C-5	
3	N+	A-6	B-23	C-41	B-6	
	N-	A-7	B-24	C-42	C-7	
32-Bit Period Time Measurement						
0	D+	A-8	B-25	C-43	B-8	
	D-	A-9	B-26	C-44	C-9	
1	D+	A-10	B-27	C-45	B-10	
	D-	A-11	B-28	C-46	C-11	
2	D+	A-12	B-29	C-47	B-12	
	D-	A-13	B-30	C-48	C-13	
3	D+	A-14	B-31	C-49	B-14	
	D-	A-15	B-32	C-50	C-15	
	0V dc	Terminals 16 thru 33			Terminals 16 and 33	
	12/24V dc	Terminals 34 thru 51			Terminals 34 and 51	

1 Auxiliary terminal blocks are required when using these terminal base units.


Example Wiring (4 Channels)
Pulse Counter



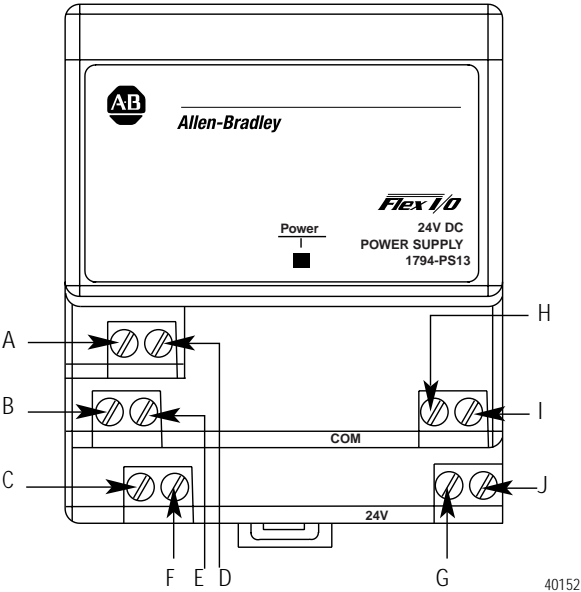
Example Wiring (4 Channels)
32-Bit Period Time Measurement



Specifications - 1794-IP4	
Number of Inputs	4 frequency counter interfaces - 2 inputs each
Counting Frequency	100KHz maximum. Each signal condition must be stable for at least 2 μ s to be recognized.
Input Range	
Input ON	Maximum 26.4V dc (24V dc +10%)
Input OFF	Minimum 6V dc Maximum 3V dc Minimum - 26.4V dc
Input Current (Typical)	3mA @ 6V dc 9mA @ 12V dc 15mA @ 24V dc
Module Location	Cat. No. 1794-TB3, -TB3S, -TBN, and -TBNF Terminal Base Units
Flexbus Current	5mA @ 5V dc
Power Supply (External)	12-24V dc (\pm 10%)
Current Consumption from External Power Supply	150mA @ 12V dc 75mA @ 24V dc
Power Dissipation	5W maximum @ 26.4V dc
Thermal Dissipation	Maximum 17.1 BTU/hr @ 26.4V dc
Indicators (field side driven, logic side indication)	1 green/red power/status indicator 8 yellow status indicators - logic side
Keyswitch Position	1
Data Format	Period read in 1 μ s counts with 1MHz internal clock selected; 0.1 μ s counts when 10MHz internal clock selected
Overflow	Maximum period is 65ms when 1MHz internal clock selected; Maximum period = 6.5ms when 10MHz internal clock selected

Dimensions HxWxD	46mm x 94mm x 53mm (1.8in x 3.7in x 2.1in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F) Note: Do not connect maximum input voltage simultaneously to all inputs if the module ambient temperature is expected to exceed 40°C (104°F).
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 90% noncondensing (operating) 5 to 80% noncondensing (non-operating)
Shock	30g peak acceleration, 11(\pm 1)ms pulse width
Operating Nonoperating	50g peak acceleration, 11(\pm 1)ms pulse width
Vibration	Tested 5g @ 10-500Hz per IEC 68-2-6
Input Conductors	
Wire	Belden 8761
Category	2 ¹
Length (Maximum)	1000ft (304.8m)
Publications	
Installation Instructions	1794-5.64
User Manual	1794-6.5.16
Agency Certification	
	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770, 4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Wiring

ATTENTION

The 1794-PS13 power supply provides sufficient 24V dc power to operate up to 4 adapter modules. Do not attempt to operate an entire FLEX I/O system with this power supply.

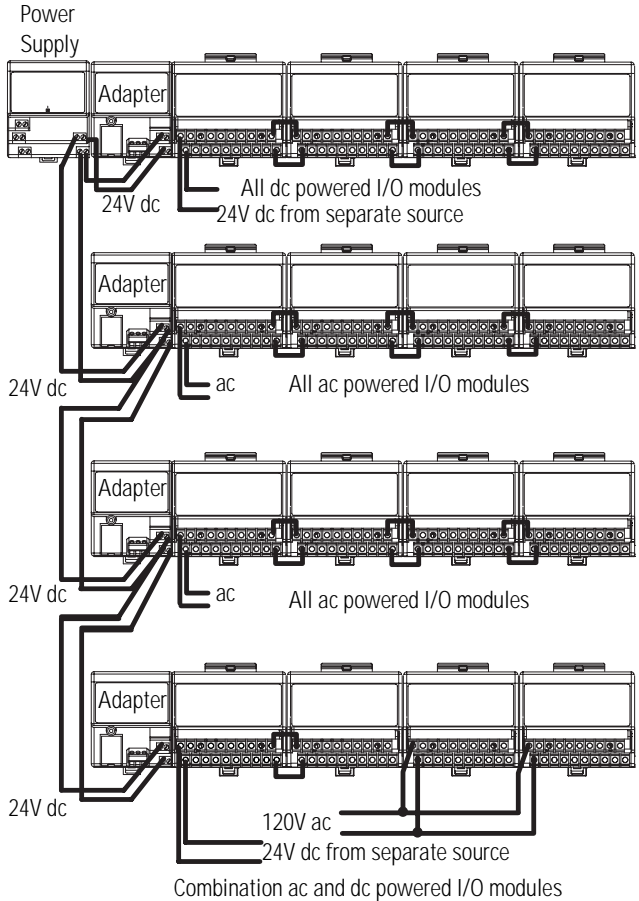
Terminals A, B, and C are 120/230V supply terminals. Terminals D, E, and F are available to daisychain this 120/230V power to other 1794-PS13 power supplies. If supplying 120V ac to the power supply, you can also power the ac modules in the adjacent system.

- 1. Connect the 120/230V ac power to the left side terminals on the connectors on the left side of the module as follows:

Connect		To
ac Ground	GND	A
120/230V ac common	L2/N	B
120/230V ac power	L1	C

- 2. Connect terminal **G** (+24V dc) to the +24V dc terminal on the first adapter.
- 3. Connect terminal **H** (+24V dc common) to the +24V dc common terminal on the first adapter.
- 4. Repeat steps 3 and 4 using terminals **I** and **J** for the second adapter.
- 5. Connections **D**, **E** and **F** are used to pass 120/230V ac power to adjacent 1794-PS13 power supplies.

Example of Using a 1794-PS13 Power Supply to Power Four Adapter Modules



Specifications - 1794-PS13

This power supply complies with the CE low-voltage directive.


Input Specifications

Nominal Supply Voltage	120V ac, 47-63Hz, 0.6A maximum 230V ac, 47-63Hz, 0.42A maximum
Voltage Range	85-265V ac
Inrush Current	40A typical, 1 ac cycle @ Vin 265V ac, 55°C
Interruption	Output voltage will stay within specification when input drops out for 1/2 cycle @ 47Hz, 85V ac with maximum load

Output Specifications

Nominal Output Voltage	+24V dc
Voltage Range	20.4-27.6V dc (includes noise & 5% ac ripple)
Output Current	1.3A maximum
Minimum Load	0mA
Output Surge	Sufficient to drive 4 adapters (surge of 23A for 2ms each)
Overvoltage Protection	Output internally limited to 35V dc. Cycle power to reenergize.
Isolation Voltage	2500V dc for 1 second

General Specifications

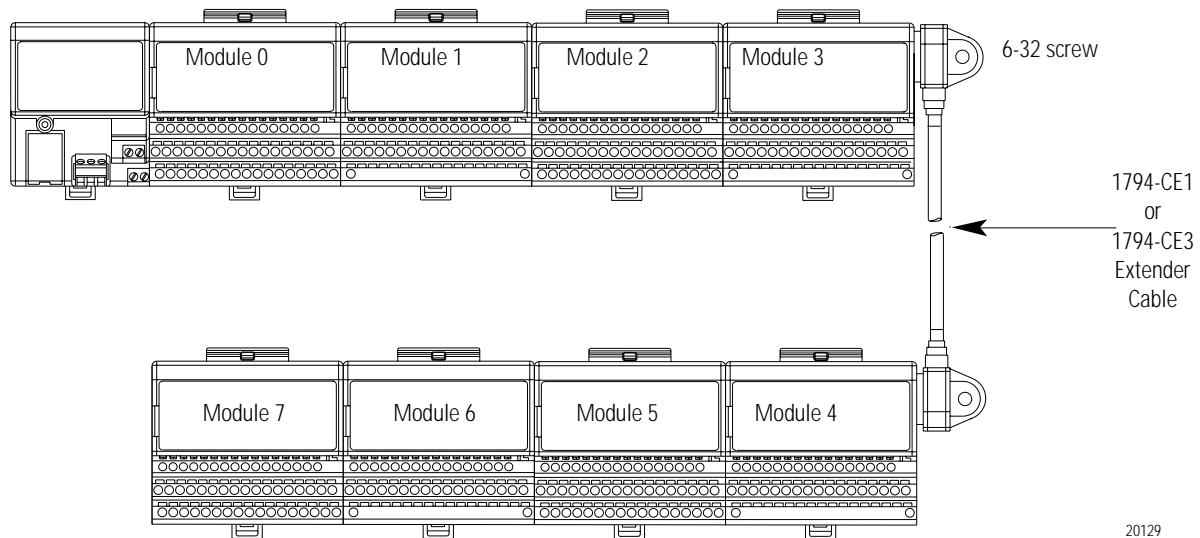
Mounting	Horizontal or vertical on a DIN rail, wall or panel
Terminal Screw Torque	5-7 lb-in
Dimensions HxWxD	87mm x 68mm x 69mm (3.4in x 2.7in x 2.7in)
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 131°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Shock	30g peak acceleration, 11(±1)ms pulse width
Operating	50g peak acceleration, 11(±1)ms pulse width
Non-operating	Tested 5g @ 10-500Hz per IEC 68-2-6
Vibration	
Conductors Wire Size	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	1 ¹
Publication	
Installation Instructions	1794-5.69
Agency Certification	

¹ Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Optional Accessories

Extender Cable (1794-CE1 and -CE3)

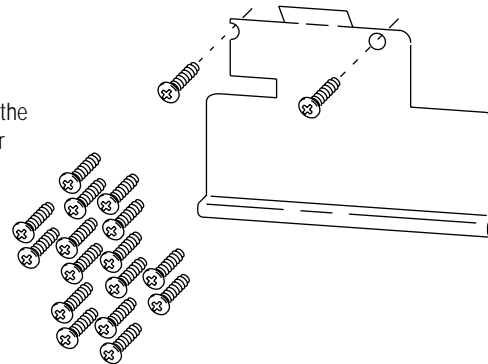
Use the optional 1794-CE1 (0.3m, 1ft) or 1794-CE3 (0.9m, 3ft) extender cable (one per system) to arrange your system in two rows or split your system into horizontal and vertical orientation. The cable can be used between any module or adapter.



Mounting Kit (1794-NM1)

Use the optional 1794-NM1 mounting kit to mount your FLEX I/O system on a panel or wall without a DIN rail.

1794-NM1
Mounting Kit with
18 screws (2 screws for the
adapter and 2 screws for
each module)



30238

Cold Junction Compensator Kit (1794-CJC2)

The cold junction compensator kit, containing two compensators, is included with the 1794-IRT8 and -IT8 modules. You can order additional compensators using the above catalog number.

Label Kit (1794-LBL)

Use the label kit to tailor the label on your FLEX I/O terminal base unit to meet your needs. The label kit includes a diecut drawing and label sheet with five labels.

ID CAT. NO.	OCTAL MODULE LABEL																		
	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17			
PLC5	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37	40	41	MIDDLE
PLC5	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	62	63	LOWER
PLC5	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17			UPPER
PLC5	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37	40	41	MIDDLE
PLC5	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	62	63	LOWER
PLC5	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17			UPPER
PLC5	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37	40	41	MIDDLE
PLC5	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	62	63	LOWER
PLC5	00	01	02	03	04	05	06	07	10	11	12	13	14	15	16	17			UPPER
PLC5	20	21	22	23	24	25	26	27	30	31	32	33	34	35	36	37	40	41	MIDDLE
PLC5	42	43	44	45	46	47	50	51	52	53	54	55	56	57	60	61	62	63	LOWER
	DECIMAL MODULE LABEL																		
SLC	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	MIDDLE
SLC	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	LOWER
SLC	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	MIDDLE
SLC	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	LOWER
SLC	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	MIDDLE
SLC	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	LOWER
SLC	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	MIDDLE
SLC	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	LOWER
	MODULE NUMBERING OR RACK ADDRESSING																		
ADDRESS 00				ADDRESS 01				ADDRESS 02				ADDRESS 03							
ADDRESS 04				ADDRESS 05				ADDRESS 06				ADDRESS 07							

40188

RSWire Software

RSWire™ software is an application that runs on top of AutoCAD® software to produce schematics with simultaneous manufacturing and support documentation. Use this software to help you integrate project schematics and panel layouts.

ABECAD Software

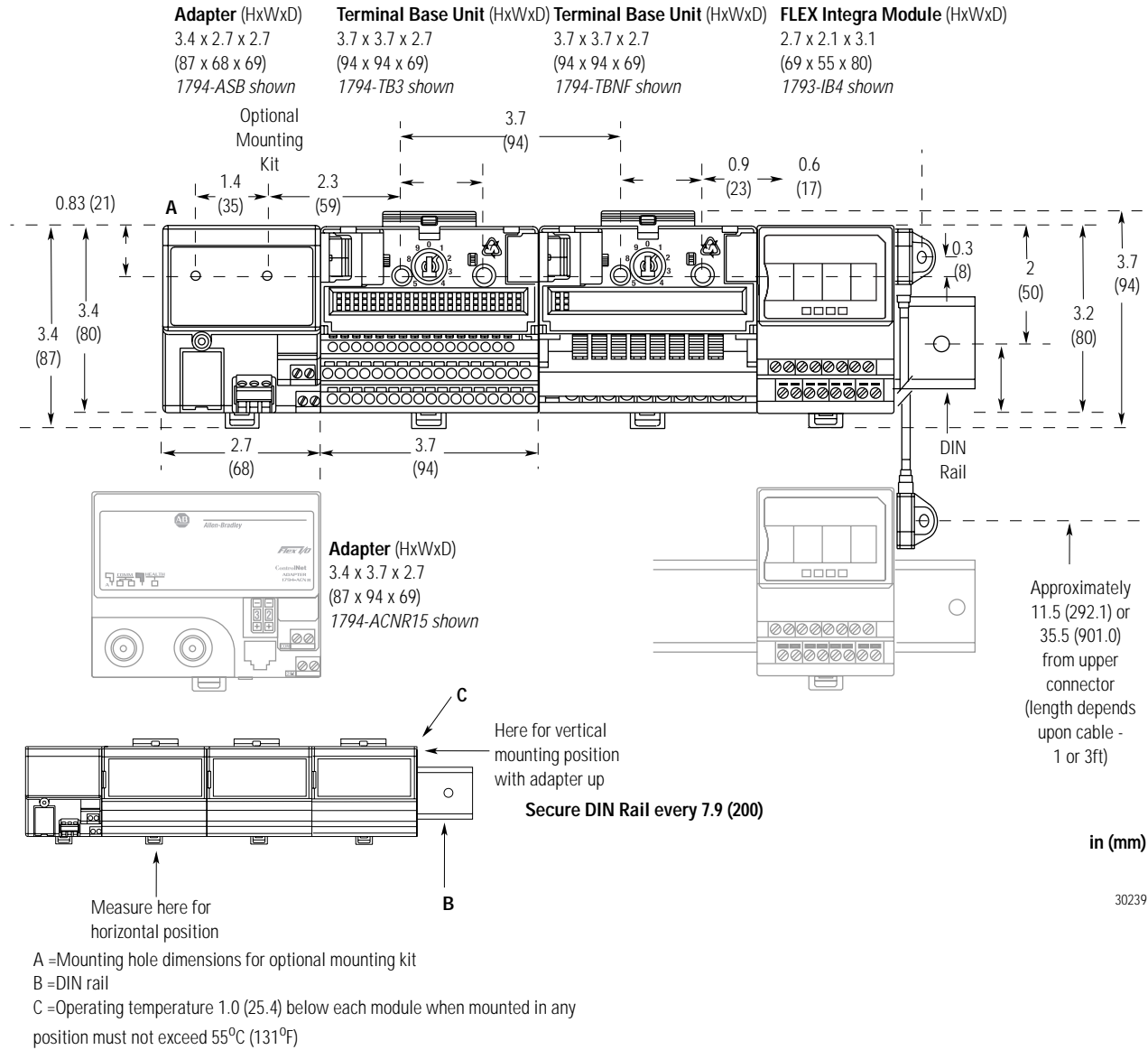
ABECAD™ software is a library of AutoCAD drawings of Allen-Bradley products. It includes many product drawings and an easy to use selection utility. You can download ABECAD software from www.ab.com or install it from the RAISE cd-rom. To obtain the RAISE cd-rom, request publication 6219-NP from your local salesperson or distributor.

	Catalog Number	Description	Related Publications	
General Information	Various I/O	I/O Systems Overview	System Overview	CIG-2.1
	1794 Series	FLEX I/O Family	Product Profile	1794-1.17
	1794 Series	FLEX I/O Family	Brochure	1794-1.16
	1793 Series	FLEX Integra Family	Product Profile	1793-1.1
Adapters	1794-ADN	24V dc DeviceNet Adapter	Installation Instructions User Manual	1794-5.14 1794-6.5.5
	1794-ADN2	24V dc DeviceNet Adapter	Installation Instructions User Manual	1794-5.65 1794-6.5.17
	1794-ACN15	24V dc ControlNet Adapter	Installation Instructions	1794-5.47
	1794-ACNR15	24V dc ControlNet Redundant Media Adapter	Installation Instructions	1794-5.48
	1794-ASB2/B	24V dc Remote I/O Adapter (up to 2 modules)	Installation Instructions User Manual	1794-5.44 1794-6.5.13
	1794-ASB/C	24V dc Remote I/O Adapter (up to 8 modules)	Installation Instructions User Manual	1794-5.46 1794-6.5.9
Bases	1794-TB3	3-Wire Screw Clamp Terminal Base Unit	Installation Instructions	1794-5.2
	1794-TB3S	3-Wire Spring Clamp Terminal Base Unit	Installation Instructions	1794-5.42
	1794-TB3T	Temperature Terminal Base Unit	Installation Instructions	1794-5.41
	1794-TB3TS	Spring Clamp Temperature Terminal Base Unit	Installation Instructions	1794-5.43
	1794-TB3G	Screw Clamp Grounded Terminal Base Unit	Installation Instructions	1794-5.51
	1794-TB3GS	Spring Clamp Grounded Terminal Base Unit	Installation Instructions	1794-5.59
	1794-TBN	Terminal Base Unit	Installation Instructions	1794-5.16
	1794-TBNF	Fused Terminal Base Unit	Installation Instructions	1794-5.17
	1203-FB1	SCANport Terminal Base Unit	Installation Instructions	1203-5.7
AC	1794-IA8	120V ac 8 Input Module	Installation Instructions	1794-5.9
	1794-IA8I	120V ac 8 Isolated Input Module	Installation Instructions	1794-5.55
	1794-IA16	120V ac 16 Input Module	Installation Instructions	1794-5.60
	1794-IM8	220V ac 8 Input Module	Installation Instructions	1794-5.57
	1794-OA8	120V ac 8 Output Module	Installation Instructions	1794-5.10
	1794-OA8I	120V 8 Isolated Output Module	Installation Instructions	1794-5.56
	1794-OA16	120V ac 16 Output Module	Installation Instructions	1794-5.61
	1794-OM8	220V ac 8 Output Module	Installation Instructions	1794-5.58
DC	1793-IB4(S)	24V dc 4 Sink Input Module	Installation Instructions	1793-5.1
	1793-IB16(S)	16 Sink Input Module	Installation Instructions	1793-5.8
	1793-IV16(S)	16 Source Input Module	Installation Instructions	1793-5.10
	1793-OB4P(S)	24V dc 4 Source Output (Protected) Module	Installation Instructions	1793-5.2
	1793-OB16(S)	16 Source Output Module	Installation Instructions	1793-5.9
	1793-OV16P(S)	16 Sink (Protected) Output Module	Installation Instructions	1793-5.11
	1793-IB2XOB2P(S)	24V dc 2 Input/2 Protected Output Combo Module	Installation Instructions	1793-5.3
	1794-IB8	24V dc 8 Sink Input Module	Installation Instructions	1794-5.30
	1794-IB16	24V dc 16 Sink Input Module	Installation Instructions	1794-5.4
	1794-IV16	24V dc 16 Source Input Module	Installation Instructions	1794-5.28
	1794-OB8	24V dc 8 Source Output Module	Installation Instructions	1794-5.31
	1794-OB16	24V dc 16 Source Output Module	Installation Instructions	1794-5.3
	1794-OB16P	24V dc 16 Source Output (Protected) Module	Installation Instructions	1794-5.45
	1794-OV16	24V dc 16 Sink Output Module	Installation Instructions	1794-5.29

	Catalog Number	Description	Related Publications	
DC	1794-OV16P	24V dc Sink Output (Protected) Module	Installation Instructions	1794-5.52
	1794-OB8EP	24V dc Electronically Fused 8 Output Module	Installation Instructions	1794-5.20
	1794-IB10XOB6	24V dc 10 Input/6 2A Output Combo Module	Installation Instructions	1794-5.24
	1794-IC16	48V dc 16 Sink Input Module	Installation Instructions	1794-5.53
	1794-OC16	48V dc 16 Source Output Module	Installation Instructions	1794-5.54
Analog	1793-IE4(S)	24V dc 4 Input Analog Module	Installation Instructions	1793-5.4
	1793-OE2(S)	24V dc 2 Output Analog Module	Installation Instructions	1793-5.5
	1793-IE2XOE1(S)	24V dc 2 Input/1 Output Analog Combo Module	Installation Instructions	1793-5.6
	1794-IE8/B	24V dc Selectable Analog 8 Input Module	Installation Instructions User Manual	1794-5.6 1794-6.5.2
	1794-OE4/B	24V dc Selectable Analog 4 Output Module	Installation Instructions User Manual	1794-5.5 1794-6.5.2
	1794-IE4XOE2/B	24V dc 4 Input/2 Output Analog Combo Module	Installation Instructions User Manual	1794-5.15 1794-6.5.2
Isolated Analog	1794-IF4I	24V dc Source Isolated Analog 4 Input Module	Installation Instructions	1794-5.38
	1794-OF4I	24V dc Source Isolated Analog 4 Output Module	Installation Instructions	1794-5.37
	1794-IF2XOF2I	24V dc 2 Input/2 Output Isolated Analog Module	Installation Instructions User Manual	1794-5.39 1794-6.5.8
Relay	1793-OW4(S)	4 Relay Sink/Source Output Module	Installation Instructions	1793-5.7
	1794-OW8	24V dc 8 Relay Sink/Source Output Module	Installation Instructions	1794-5.19
Specialty	1794-IR8	24V dc RTD Input Module	Installation Instructions User Manual	1794-5.22 1794-6.5.4
	1794-IRT8	24V dc Thermocouple/RTD Input Module	Installation Instructions User Manual	1794-5.50 1794-6.5.12
	1794-IT8	24V dc Thermocouple/mV Input Module	Installation Instructions User Manual	1794-5.21 1794-6.5.7
	1203-FM1	24V dc SCANport Module	Installation Instructions	1203-5.8
Counters	1794-IJ2	24V dc 2 Input Frequency Module	Installation Instructions User Manual	1794-5.49 1794-6.5.11
	1794-VHSC	24V dc 2 Channels Very High Speed Counter Module	Installation Instructions User Manual	1794-5.67 1794-6.5.10
	1794-ID2	24V dc 2 Input Pulse Counter Module	Installation Instructions User Manual	1794-5.63 1794-6.5.15
	1794-IP4	12/24V dc 4 Input Pulse Counter Module	Installation Instructions User Manual	1794-5.64 1794-6.5.16
Power Supply	1794-PS13	Power Supply Module (1.3A)	Installation Instructions	1794-5.69
Accessories	1794-CE1	Extender Cable, 0.3m (1ft)	Installation Instructions	1794-5.12
	1794-CE3	Extender Cable, 0.9m (3ft)	Installation Instructions	1794-5.12
	1794-NM1	Mounting Kit	Installation Instructions	1794-5.13

Contact your local A-B distributor for information on ordering any of the above publications.

For electronic copies of these publications, go to:
<http://www.theautomationbookstore.com>



At Allen-Bradley, customer service means experienced representatives at Customer Support Centers in key cities throughout the world for sales, service, and support. Our value-added services include:

Technical Support

- SupportPlus programs
- Telephone support and 24-hour emergency hotline
- Software and documentation updates
- Technical subscription services

Engineering and Field Services

- Application engineering assistance
- Integration and start-up assistance
- Field service
- Maintenance support

Technical Training

- Lecture and lab courses
- Self-paced computer and video-based training
- Job aids and workstations
- Training needs analysis

Repair and Exchange Services

- Your only “authorized” source
- Current revisions and enhancements
- Worldwide exchange inventory
- Local support

The following are trademarks of Rockwell Automation: FLEX I/O, PLC, SLC, SCANport, and PanelView.

DeviceNet is a trademark of Open DeviceNet Vendor Association (O.D.V.A.).

ControlNet is a trademark of ControlNet International.

RSWire is a trademark of Rockwell Software, Inc.

AutoCAD is a registered trademark of Autodesk, Inc.

Reach us now at www.rockwellautomation.com

Wherever you need us, Rockwell Automation brings together leading brands in industrial automation including Allen-Bradley controls, Reliance Electric power transmission products, Dodge mechanical power transmission components, and Rockwell Software. Rockwell Automation's unique, flexible approach to helping customers achieve a competitive advantage is supported by thousands of authorized partners, distributors and system integrators around the world.

Americas Headquarters, 1201 South Second Street, Milwaukee, WI 53204, USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444

European Headquarters SA/NV, avenue Herrmann Debroux, 46, 1160 Brussels, Belgium, Tel: (32) 2 663 06 00, Fax: (32) 2 663 06 40

Asia Pacific Headquarters, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846



Rockwell Automation

Publication 1794-2.1 - January 2000

Supersedes Publication 1794-2.1 - February 1999

© 2000 Rockwell International Corporation. Printed in the U.S.A.